

Physical activity and sedentary time associated with learning outcomes in adult distance learners

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- P565 Academic outcomes are better among girls with higher cardiorespiratory fitness, independent of weight- and socioeconomic status
- P566 An intervention program improved food consumption in students attending public elementary schools in Sonora Mexico

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- P567 Muscular strength is inversely related to Body Adiposity Index (BAI) in young individuals

KEYNOTES AND INVITED LECTURES

KEYNOTE

KEYNOTE 1

SIMÓN BARQUERA

Medical Surgeon, Universidad Autonoma Metropolitana, Mexico City, Mexico

Large scale obesity prevention policies in Mexico: The process, results, push backs and future challenges

Mexico has experienced one of the largest shifts in obesity ever seen in a very short time. The underlying dietary and body composition shifts and the accompanying changes in NCD prevalence, particularly diabetes, are well documented. In 2006 scholars and government officials, partnered with a few international scholars, began a complex process of setting policies and guidelines to generate the basic for large-scale regulatory and taxation policies. Coupled with active civil society initiatives, this led to the first large-scale public health related set of taxes on all beverages with added sugar and junk food. The process and current status of the evaluation of these changes will be presented.

KEYNOTE 2

SUSAN MICHIE

Professor of Health Psychology, University College, London, UK

Evaluating behavior change interventions in terms of their component techniques

Interventions to change physical activity and eating behaviors have had modest and variable success. To some extent, this reflects limitations in the scientific methods we use to study and change behavior. Interventions are complex in that they are usually made up of several interacting component behavior change techniques (BCTs). In order to improve interventions, we need to be able to identify the effective BCTs within complex interventions and understand their mechanisms of action. This talk will present BCT Taxonomy v1, a method for specifying interventions in terms of their BCTs using standardised terms and definitions developed by cross-disciplinary and international consensus. The talk will report results of applying this to identifying effective BCTs within interventions aimed at increasing physical activity and healthy eating and illustrate the power of using theory to guide such analyses. It will also present a method for designing effective interventions, starting with a model of behavior which allows an analysis of the target behavior in context. This links to the Behavior Change Wheel, which integrates 19 frameworks of behavior change into 9 intervention functions and 7 policy categories. Identifying relevant intervention functions points to the type of BCTs that are likely to be effective in changing behaviors in their context.

KEYNOTE

KEYNOTE 3

FALKO SNIEHOTTA

Newcastle University, UK

Changing physical activity and dietary behaviors: Conceptual and empirical analyses of initiation and maintenance

There is now good evidence about how to support individuals in changing physical activity and nutritional behaviors and how to lose weight.

However, effects usually peak within the first year from the initiation of interventions and evidence for long-term sustainability of intervention effects is variable and often modest. Current knowledge about behavior change maintenance and weight loss maintenance is limited. Developing the theoretical and evidential base for maintenance of behavior change is key to developing sustainable solutions for public health challenges associated with physical inactivity and poor diet, such as obesity. This talk will report and synthesise evidence from several recent systematic reviews of RCTs testing behavioral interventions, qualitative work in weight loss maintenance, and a range of quantitative studies about long term maintenance of weight loss and behavior change. This evidence will be used to establish what is already known about behavior change maintenance and to develop an agenda for future research and practice.

KEYNOTE 4

ERIC FINKELSTEIN

Duke-NUS Graduate Medical School, Singapore

Behavioral Economics - Evidence for Chronic Disease Prevention

Reducing the incidence and severity of chronic diseases have become a major public health and economic imperative. The onset and management of chronic diseases are often related to or driven by suboptimal behaviors, including inactivity, poor diet, low uptake of screening and other preventive service, and poor medication adherence. Behavioral economics, which integrates economics and psychology to study the way people make choices, has emerged as a promising tool to address these suboptimal behaviors.

KEYNOTE 5

MARJOLEIN VISSER

Department of Health Sciences, VU University, Amsterdam, the Netherlands and the Department of Internal Medicine, VU Medical Center, Amsterdam, the Netherlands

The lost generation? Combating obesity in older adults

Older adults have the highest prevalence of obesity compared to all other age groups. Yet little attention is paid to the prevention and treatment of obesity in old age. The presentation will provide a brief overview of the consequences of obesity in old age. Special attention will be paid to often reported better survival of obese older adults, known as the 'obesity paradox', and the impact of using a life course approach when studying the impact of obesity on health and physical functioning in old age. The presentation will also include an overview of recent studies addressing the potential benefits of weight loss in old age. Finally, the perception of and satisfaction with body weight by older adults will be described, as well as perceived barriers for having a healthy weight.

KEYNOTE

KEYNOTE 6

THOMAS ROBINSON

Professor of Pediatrics and of Medicine, Stanford University, Stanford, California, USA

Solution-Oriented Research to Prevent and Treat Childhood Obesity

Most biomedical research is focused on identifying problems - causes and correlates of disease. In contrast, Solution-Oriented research is focused on answering the practical questions of: What works and how to do it?

A Solution-Oriented research paradigm prompts investigators to explore novel, theory-driven intervention strategies and the processes of change.

This distinction has important implications for intervention and study design. This approach led to the development of Stealth Interventions that emphasize the incentive value of intervention activities themselves. Stealth Intervention principles have been applied to successfully prevent and control weight gain in both population-based and overweight samples of children and adults. Further application of this model has led to the development of interventions that harness the motivational effects of social and ideological movements to promote greater magnitude and more sustained changes in behavior. The major advantages of this approach to intervention design are its foundations in theory and empirical research, it can be applied at all levels of intervention, it is most consistent with systems strategies, it is Solution-Oriented, and it encourages interdisciplinary alliances and synergies.

INVITED LECTURES

EARLY CAREER INVITED LECTURES

IL01 *Using GPS to improve understanding of built environment influences on physical activity*

Jordan A. Carlson, Department of Family and Preventive Medicine University of California, San Diego, California, USA

GPS combined with accelerometry allows objective assessment of physical activity locations and active and passive travel time. Integrating these data with measures of the built environment could improve understanding of environmental influences on physical activity. In this talk, I will present findings from a series of studies using GPS and accelerometry.

IL02 *The independent and combined associations of physical activity and sedentary behavior in youth: State of the art and future research directions*

Rute Santos, Maia Institute of Higher Education, Portugal

In many developed countries, children and adolescents seem to have fewer opportunities to be active and more to be sedentary than previous generations. This shifting in physical activity and sedentary patterns - called “the physical activity transition” (Katzmarzyk et al, 2009) - is associated with the obesity epidemic and may have the potential to attenuate future gains in life expectancy. During childhood and adolescence, both physical activity and sedentary behavior seem to influence health; however, the combined health-associations of physical activity and sedentary behavior remain poorly understood. Given that sedentariness and physical activity are two independent and not mutually exclusive behaviors with different effects on health outcomes, a better understanding of the synergistic effect of sedentary behavior and physical activity are important from a public health prevention point of view. This presentation will provide a comprehensive overview of the available evidence on the independent and combined associations of physical activity and sedentary behavior on health-outcomes in youth, with a special focus on cardiovascular risk factors. Results from representative Portuguese studies will also be reported. Finally, gaps in the literature and future research directions will be discussed.

INVITED LECTURES

PhD INVITED LECTURES

IL03 The social construction of nutrition patterns in times of recession: A critique

Bart De Clercq, Ghent University, Faculty of Medicine and Health Sciences, Ghent, Belgium

Often well-intended intervention programs that aim to increase health may also reinforce inequalities in health. Popular concepts like social capital and health literacy proved to be attractive resources in health promotion. Unfortunately, such concepts are too often employed in romantic ways neglecting power differentials and conflict within society. 'Why do people fail to comply with healthy eating advice?' is a central question for public health practitioners and health promoters.

The present contribution focusses on the social contexts in which lives are lived. Following a Bourdieusian perspective, the author claims that nutrition patterns are socially reproduced through the interaction of different forms of capital (social, cultural and economic). Moreover, this dynamic may be especially relevant in the current economic and epidemiological context.

We need to address the conditions in which people are born, grow, live, work, and age - the causes of the causes. This is not to ignore action on proximate causes like reduce smoking and dissuade soft drink consumption. We need to do both. Health promotion interventions need to take into account that they carry the potential for decreasing as well as the risk of increasing social inequality in times of recession.

IL04 *Does the company of a dog influence affective response to exercise? An ecological momentary assessment study*

Yue Liao, University of Southern California. Los Angeles, California, USA

There is increasing evidence that dog owners are more physically active than non-owners. However, little is known about how frequently dog owners actually exercise with their dogs and whether the company of a dog influences affective response to exercise. The current study aims to address these questions using a real-time capture strategy - Ecological Momentary Assessment (EMA).

SYMPOSIA

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S01

Perception and measurement of healthy portions

Moderator: Michael Siegrist, Institute of Food, Nutrition and Health, ETH Zurich, Zurich, Switzerland

Presenters: Claire Collins, Moira Dean, Violeta Stefan, Tamara Bucher

Purpose:

Rising rates of obesity correspond to increases in portion sizes. Experimental studies have shown that providing subjects with larger portions leads to significantly higher energy intakes. However, little is known about what factors other than the mere presence of large portions predict the portion size individuals choose to consume and how portion sizes of different foods groups changed over time. Data on these open questions is presented and discussed in this symposium. Furthermore, a new tool for experimental portion size research is presented.

Rationale:

Portion size affects food intake, but little is known about portion size related behaviors. New insights into predictors, perceptions and norms are presented, and potential applications for preventive measures are discussed.

Objectives:

Aims to present and discuss:

- Longitudinal trends in children's portion size consumption behaviors
- Predictors of portion size
- The validity of an online tool for measuring portion size

Summary:

In this symposium, we discuss how children's portion size related behavior has changed over time and which predictors influence choice of portion size.

Claire Collins will present data from the National Nutrition Survey in Australia, where longitudinal trends over a 12-year period have been analyzed.

The next two speakers will present data from two large-scale surveys conducted in Denmark and Ireland. Moira Dean compared the influence of biological variables, socio-demographic variables, psychological predispositions and meal-related variables on choice of portion size, while Violeta Stefan analyzed how social and portion size-related eating norms influence portion size-related behaviors. Finally, Tamara Bucher will present an innovative tool that was developed to experimentally assess factors, which affect portion choice.

S01.1

Validity assessment of an online tool for measuring planned portion size as a dependent variable

Authors: Tamara Bucher, Carmen Keller

Purpose:

Online surveys that use pictures to estimate portion sizes and food intake have become increasingly popular. Only few tools have been validated by comparing recalled portion size with actual food intake, and no data on the agreement of planned food intake with subsequent actual consumption exists. This needs to be shown, before planned food intake is measured as a dependent variable in interventions that aim to improve consumers' food choices.

Methods:

An "online buffet" was developed as a tool for assessing planned meal composition. Respondents choose preferred foods and proportions for a main meal (144 combinations are possible). The validity was assessed by comparing a meal composed with the online buffet and actual food intake 24-48 h later (n=32). Furthermore, correlations of food preferences and health interest with meals chosen from the online buffet were analyzed (n=106).

Results:

Meals chosen in the online buffet (M=2998 kJ, SD=471) agreed with actual consumption ($r_s=.63$, $p<.001$) but were on

average 367 kJ (10.5%) lower in energy than consumed meals ($M=3480$ kJ, $SD=755$). Preferences were highly associated with chosen amounts, and general health interest was negatively correlated with the total energy selected ($r=-.40$, $p<.001$).

Conclusions:

Meal choice in the online buffet agrees sufficiently well with actual intake to measure choice as a dependent variable in interventions that aim at improving healthy choices. High correlations of preferences with chosen amounts and an inverse association of health interest with the mean energy chosen further indicate the validity of the tool. Possible applications are discussed.

S01.2

Factors predicting the portion size and perceived fullness of evening meals in Danish and Irish households

Authors:

Moirá Dean, Michelle Spence, Violeta Stefan, Liisa Lähteenmäki

Purpose:

This study explored how meal-related variables, socio-demographics and psychological predispositions affect the portion size and perceived fullness of an evening meal in Danish and Irish households.

Methods:

Using survey data collected in 2115 respondents from Denmark (DK) and the Island of Ireland (IOI), we compared four sets of predictors of the portion size chosen for four evening meals (i.e. pizza/soup/chicken salad/pork meal): Biological variables (hunger, thirst), socio-demographic variables (gender, age, BMI); psychological predispositions (cognitive restraint, uncontrolled eating, emotional eating, general health interest) and meal-related variables (expected fullness, perceived healthiness, liking, frequency of consumption). We also compared five sets of predictors (the previous four plus portion size) of perceived portion fullness.

Results:

Portion size selections were associated mainly with demographic variables (gender, BMI) and psychological predispositions (cognitive restraint, uncontrolled eating). In addition, only liking and sometimes expected healthiness (meal-related variables) appeared as drivers. Conversely, perceived portion fullness was mostly influenced by the selected portion size as well as expected fullness and liking. There were some differences between meals; e.g. GHI not a predictor for Pizza but a predictor for Chicken salad. Also some country differences were observed; emotional eating predicted portion selection in the IOI but not DK.

Conclusions:

When making portion size selections at home, psychological predispositions, restrained and uncontrolled eating as well as meal-related variables, liking and healthiness explained the decisions. However, surprisingly, individuals' expected fullness of a food did not influence their portion size selection but was a driver of fullness of the selected portion.

S01.3

The role of social eating norms in portion size-related behavior in Denmark and Island of Ireland

Authors:

Violeta Stefan, Moirá Dean, Michelle Spence, Liisa Lähteenmäki

Purpose:

Social norms influence eating behavior, but little is known about their role in portion size-related behavior. This study explored the role of social eating norms in Denmark (DK) and the Island of Ireland (IOI) in relation to portion size-related behavior.

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Methods:

In a survey DK (n=1063) and IOI (n=1012) respondents rated social eating norms (11 items) and portion size-related behavior (3 items) on a 7-point scale (1=strongly disagree to 7=strongly agree). The 3 items relate to: 1) anticipating how much will be eaten at the beginning of a meal, 2) clearing the plate, and 3) clearing the plate even when full. Socio-demographics and eating attitudes (e.g. cognitive restraint) were measured as background variables.

Results:

Two social eating factors were identified: The 'limit intake' norm (6 items) and the 'plate cleaning' norm (3 items). The DK participants reported stronger 'limit intake' norms and weaker 'plate cleaning' norms than IOI. In both countries females reported stronger 'limit intake' norms while males reported stronger 'plate cleaning' norms. In DK, age was positively correlated with both social eating norm factors. The 'limit intake' norm had stronger association with anticipating how much will be eaten at the beginning of a meal, but the 'plate cleaning' norm had stronger association with clearing the plate. Only the 'plate cleaning' norm was associated with clearing the plate even when full.

Conclusions:

The social eating norms vary significantly between countries and genders. The 'limit intake' and 'plate cleaning' norms play a role in consumers' reported portion size-related behavior.

S01.4

Food and beverage portion sizes in Australian children: A secondary analysis of 1995 and 2007 national data

Author:

Clare Collins

Purpose:

To evaluate whether Australian children's portion sizes of selected foods have changed from 1995 to 2007.

Methods:

A time-series study was conducted to compare the dietary data of children, aged 2-16 years, from two nationally representative cross-sectional surveys among Australian households. This study used data from the 1995 National Nutrition Survey (n=2198) and the 2007 Australian National Children's Nutrition and Physical Activity Survey (n=4799). The portion sizes of common foods and beverages were assessed from 24-hour recalls across the survey years.

Results:

Across all age and sex categories, the portion sizes increased in 15% of the food items, decreased in 24% and remained stable in the others. In particular, the portion sizes for packaged foods, such as yoghurt (25-100 g) and potato crisps (4-5 g), and for most vegetables decreased; remained constant or decreased for beverages and dairy foods; and remained constant or increased for fruits. Meat-based dishes increased by up to 48%. The portion sizes of fruits and vegetables did not align with the Australian Guide to Healthy Eating serving sizes.

Conclusions:

Portion sizes of vegetables and packaged snacks have decreased, while in processed meats they have increased. This data can assist in refining dietary recommendations targeting children and adolescents.

S02

Multi-institutional approaches to community based nutrition interventions

Moderator: Bent Egberg Mikkelsen, Aalborg University, Copenhagen, Denmark

Presenters: Joel Gittelsohn, Bent Egberg Mikkelsen, Rachel Novotny

Discussant: Joel Gittelsohn, Johns Hopkins University, USA

Purpose:

This session will move beyond single setting approaches and address the potentials of the increasing number of multi-institutional approaches to community based public health nutrition interventions from around the world.

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Rationale:

Individual-level and single institution-based programs have been largely unsuccessful in addressing the obesity epidemic. As a result recent innovative programs have been taking a different approach and are aiming at doing integrated and coordinated programs across several institutional and community settings at the same time. Such interventions can target a broad category of settings such as schools, kindergartens, supermarkets, corner-stores, restaurants and community media actors simultaneously and in coordination, a so-called super-settings approach. Such programs often need to give in on the possibility of demonstrating quick and clear effects on traditional outcome measures. Furthermore they face challenges in terms of lengthy formative and participatory processes and difficulties in coordination, and dissemination. However in terms of sustainability-of-intervention they show promising results.

Objectives:

This symposium takes a global perspective and brings researchers from around the world together in order to present and discuss examples of interventions using a super-settings approach for community-based programs. Important topics covered would be: How best to engage stakeholders from multiple institutions in order to build ownership and sustainability? How do we synchronize interventions across multiple settings within communities to create cohesion and consistency and what could joint values and principles for the overall intervention be? How do we know which intervention components are creating what effect and how do we evaluate complex programmes? Which methods for evaluation are suitable and acceptable in terms of scientific standards and in the same time low-cost and easy to administer for the local stakeholders?

Summary:

With presentations from different continents on multi-institutional approaches this session will illustrate the diversity in approaches and be able to paint a rich picture of advantages and pitfalls of such approaches as well as contribute to setting methodological and theoretical directions for the research community.

S02.1**Convening, partnering and role modeling for child health; the Children's Healthy Living (CHL) program****Authors:**

Rachel Novotny, Claudio Nigg, Kathryn Braun, Jean Butel, Andrea Bersamin, Jonathan Deenik, Jang Kim, Rachael Leon Guerrero

Purpose:

Convene diverse groups and form partnerships with community leaders to develop a credible inspiring sustainable intervention that leverages community strengths and builds capacity to improve child health.

Methods:

Building on concepts of positive deviance and positive disruption, the CHL program fostered partnership and leadership for the CHL intervention among diverse role models in identified communities of the US affiliated Pacific region. Partners and leaders were from not-for-profit organizations, small businesses, preschools, health organizations, farmer's markets and others.

Results:

The CHL intervention encouraged active play, decreased screen time, increased sleep, increased fruit and vegetable intake, decreased sugary beverages and increased water intake in multiple social, cultural, political, economic and physical environments in the community. Role model trainings included topics of health coaching, how to communicate, how to empower individuals, how to work from your strengths, and how to be a good health behavior role model.

Conclusions:

The role model leaders promoted and developed sustainable environmental changes and inspired others to put children's health in the forefront of the community.

S02.2

Implementing multi-component interventions to improve the food environment in Baltimore City

Authors:

Joel Gittelsohn, Elizabeth Anderson Steeves, Nadine Budd, Ransom Wyse, Yeeli Mui, Anna Kharmats, Laura Hopkins, Claire Welsh

Purpose:

Multi-component interventions are needed in low income urban settings to address complex environmental, economic and social issues that drive the obesity epidemic. Low income neighborhoods in Baltimore can be described as “food swamps,” with few supermarkets and many small food outlets stocking unhealthy foods with few healthier options. We have conducted interventions in Baltimore to modify the food environment by increasing availability, affordability, and promotion of healthier foods to reduce obesity and chronic disease.

Methods:

This work, based on substantial formative research and community engagement processes, has been implemented in corner stores, supermarkets, carryouts, wholesalers, churches and recreation centers. This paper tracks the progression of these trials from work in small food sources (Baltimore Healthy Stores, Baltimore Healthy Carryouts), to work with wholesalers (B'More Healthy Retail Rewards), to inclusion of multiple institutional venues (Baltimore Healthy Eating Zones), to ongoing work with systems science modeling to inform policies supporting environmental changes (B'More Healthy Communities for Kids).

Results:

We will present process evaluation and impact results of the completed trials. Our studies have significantly increased consumer use of healthier food preparation techniques and improved access, purchasing, and consumption of healthier food options for adults and children. We will also present baseline data from the current trial (BHCK), along with discussion of intervention development and stakeholder engagement in this super-setting study.

Conclusions:

Information from these studies will provide insight on how to create sustainable changes to the food environment of low income urban settings to reduce risk of obesity and chronic diseases.

S03

Associations between PA, cognitive performance and academic achievement in children and adolescents

Moderator: Renate De Groot, Open University of the Netherlands, Heerlen, The Netherlands

Presenters: Martin Van Dijk, Heidi Syväoja, Dominika Pindus

Discussant: Marko Kantomaa, LIKES - Research Center for Sport and Health Science, Jyväskylä, Finland

Purpose:

To present novel findings on the associations between objectively measured physical activity (and time spent sedentary), cognitive performance and academic achievement in children and adolescents from three countries: The Netherlands, Finland and the United States.

Rationale:

The positive effects of physical activity on children's physical health are well documented. Less is known about the relationship between physical activity and cognitive performance and academic achievement in youth and studies on these associations reported mixed results. Thus far, in the majority of studies, questionnaires (i.e., self-report) were used to measure physical activity. This subjective measure of physical activity has been found to have several limitations, such as social desirability and recall bias. Therefore, it is important to use an objective instrument (e.g. accelerometer or heart-rate monitor) when investigating physical activity levels and intensity. This symposium focuses on different aspects of objectively measured physical activity (total amount of physical activity, sedentary behavior, physical activity before school and physical activity intensity) associated with cognitive performance and academic achievement in children and adolescents.

Objectives:

1. To present findings on the associations between objectively measured physical activity, time spent sedentary, cognitive function and academic achievement in children and adolescents using cross-sectional and intervention designs.
2. To discuss: a) the importance of objective measurement of physical activity (and time spent sedentary) when evaluating its relations to cognitive performance and academic achievement, b) the cognitive functions which are likely to be associated with physical activity and sedentary time, c) the question of a dose-response nature of these relationships within an intervention design.
3. The symposium also aims to serve as a platform for the discussion of broader issues pertinent to the study of physical activity, cognition and academic achievement as well as future research directions.

Summary:

Using three high quality research designs in different populations, more insight will be obtained into the debated field of physical activity, cognitive performance and academic achievement in children and adolescents. First, the associations between physical activity and sedentary behavior, measured objectively using accelerometers, and cognitive performance in Finnish children will be presented. Second, associations between objectively measured physical activity before school, including active commuting to school, and cognitive performance and academic achievement in Dutch adolescents will be discussed. In the final presentation, the relations of different intensities of physical activity to changes in children's cognitive performance following a 9-month FITKids physical activity intervention will be discussed.

S03.1

Physical activity before school, cognitive performance and academic achievement in Dutch adolescents: Let them walk or cycle to school!

Authors:

Martin Van Dijk, Renate De Groot, Frederik Van Acker, Hans Savelberg, Paul Kirschner

Purpose:

To investigate the associations between physical activity before school (PABS), including active commuting to school, and cognitive performance and academic achievement in Dutch adolescents. In addition, we investigated whether these associations were moderated by sex.

Methods:

A total of 389 adolescents (mean age 13.4 years; 48% girls) were included in the analyses. PABS was measured objectively by ActivPAL3™ accelerometer attached on the thigh. The total amount of physical activity before the start of the school day (between 7:00am and 8:40am) was calculated. Cognitive performance was measured by the d2 Test of attention (related to key components of higher-order cognitive functioning) and Symbol Digit Modalities Test (information-processing speed). Academic achievement was determined by the mean of the school grades in Dutch, mathematics and English. Data were analysed by multiple regression analyses and explored for interaction effects.

Results:

PABS was significantly correlated with the total amount of physical activity per week ($r=.48$, $P<.001$). PABS was overall not significantly associated with cognitive performance and academic achievement. However, PABS was positively associated with key components of higher-order cognitive functioning in girls ($\beta = .18$, $P=.039$), but not in boys ($\beta = -.10$, $P=.217$).

Conclusions:

PABS, including active commuting to school, might be positively associated with key components of higher-order cognitive functioning in adolescent girls. Although PABS is overall not associated with cognitive performance and academic achievement, we recommend adolescents to walk or cycle (or other forms of active commuting) to school instead of by motorized transportation, because ACS contributes significantly to physical activity levels.

S03.2

Physical activity and sedentary time are associated with children's attentional processes

Authors:

Heidi Syväoja, Tuija Tammelin, Timo Ahonen, Anna Kankaanpää, Marko Kantomaa

Purpose:

To evaluate the associations between physical activity, sedentary behavior and cognitive functions in children.

Methods:

230 Finnish children (mean age 12.2 years; 56% girls) participated in the study. Self-reported moderate to vigorous physical activity (MVPA) and screen time were evaluated with the questions used in the "WHO Health Behavior in School-aged Children" study. Physical activity and sedentary time were measured objectively for seven consecutive days using the ActiGraph GT1M/ GT3X accelerometer. A cut-off value of 2,296 counts per minute (cpm) was used for MVPA and 100 cpm for sedentary time. Cognitive functions including visual memory, executive functions and attention (reaction time and sustained attention) were evaluated with a computerized Cambridge Neuropsychological Test Automated Battery (CANTAB) using five different tests. Structural equation modeling was applied to examine how MVPA and sedentary behavior were associated with cognitive functions.

Results:

A high level of objectively measured MVPA was associated with good performance in the reaction time test ($p=0.026$), independently of sedentary time and gender. A high level of objectively measured sedentary time was associated with good performance in the sustained attention test ($p=0.003$), independently of MVPA and mother's education. Objectively measured MVPA and sedentary time were not associated with other measures of cognitive function. Self-reported MVPA and screen time were not associated with cognitive functions.

Conclusions:

In this study, physical activity and sedentary time were associated with children's attentional processes. More research is needed to clarify our understanding of the effects of physical activity and sedentary behavior on cognitive prerequisites of learning.

S03.3

Physical activity intervention and changes in cognitive control in pre-pubertal children: Does intensity matter? Insights from the FITKids randomized controlled trial

Authors:

Dominika Pindus, Naiman Khan, Eric Drollette, Robert Davis Moore, Mark Scudder, Lauren Raine, Lauren Sherar, Charles Hillman

Purpose:

Intervention studies suggest that physical activity (PA) positively impacts cognitive performance in childhood. However, little is known about the dose-response effect of PA on measures of children's cognition. To evaluate the relation of different intensities of intervention-specific PA to cognitive control in pre-adolescent children.

Methods:

81 (46 girls) children ($\text{Mage} = 9.5 \pm .56$ yrs) were included in analyses. Children engaged in 70 minutes of daily structured PA sessions during a 9-month intervention. Heart rate was monitored during each session. The percent of time spent in light (LPA: <55% of maximum heart rate), moderate (MPA: 55-80%), and vigorous (VPA > 80%) PA in the structured sessions was calculated. Cognitive control was measured using a modified flanker task and expressed as pre-to-post intervention change in mean reaction time (MRT).

Results:

Children actively participated in 112.9 (± 24.6) days of intervention. Only percent of time spent in VPA was positively related to gains in MRT for trials which require higher cognitive control ($\beta = .27$, $\Delta R^2 = .06$, $p = .03$, $F(2, 77) = 3.91$, p

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= .02). Time spent in VPA was also positively ($B = .24$, $\Delta R^2 = .05$, $p = .04$, $F(3,76) = 3.38$, $p = .02$), and time spent in MPA negatively ($B = -.30$, $\Delta R^2 = .07$, $p = .01$, $F(3,76) = 4.21$, $p = .01$) associated with an increase in interference control (i.e. the difference in MRT between task conditions which require different levels of cognitive control).

Conclusions:

These results indicate that only high intensity PA may afford specific benefits to children's cognitive control.

S04

Integrated approach to quantification of free-living PA and sedentary behavior

Moderator: Malcolm Granat, University of Salford, Manchester, UK

Presenters: Johannes Bussman, Malcolm Granat, Genevieve Healy, David Bassett

Discussant: Malcolm Granat, University of Salford, Manchester, UK

Purpose:

The quantification of free-living physical behaviors is important in understanding how physical activity and sedentary behavior impact on health and on how interventions might modify free-living behavior to enhance health. Activity monitors can provide important insights into these behaviors however data from these monitors is typically only reported as summary volumetric measures. These summary measures are not necessarily reflective of the behaviors that underlie them. In addition quantification of these behaviors has been hampered by the terminology used. For example research in the areas of "Sedentary Behavior" and "Physical Activity" may or may not encompass light activities or lying, and we are not explicit about this.

The purpose of this symposium is to promote discussion on how we might unify the concepts and terms presently used, to generate a model for describing free-living Physical Behavior which could encompass all types of physical behavior, including physical activities from sleep to vigorous physical activities. We will also explore how we can quantify these Physical Behaviors to address the challenges of understanding the interdependence of, and relationships between, health outcomes and free-living activity.

Rationale:

In comparison to diet, where the complex relationships between nutrition and health outcomes have been explored, we presently only employ simple models of the relationship between free-living physical behavior (such as Physical Activity and Sedentary Behavior) and health. A major barrier to advancing our understanding is the lack of an overarching model.

Objectives:

1. To outline current methodologies, predominantly volumetric measures.
2. To examine the potential impact of a unifying Physical Behavior model might have on our research
3. To look at examples of how we could quantify patterns of Physical Behaviors and the impact on the development of clinical outcomes.

Summary:

The following four presentations will be given:

1. The state of the art of existing approaches to measurement of the Physical Activity: Volumes or patterns
2. Physical Behavior model and Event based analysis - case studies where events provide more information than volume
3. Going beyond the total in understanding sedentary behavior change
4. Quantification of Physical Behaviors - Providing improved clinical outcomes.

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S04.1

Quantification of physical behaviors - providing improved clinical outcomes

Authors:

Johannes Bussmann, Rita van den Berg-Emons

Purpose:

Many diseases and disorders affect a person's physical behavior (PB). PB is not only important for physical health, but also from the viewpoint of (disability in) functioning in daily life, participation, mental well-being and quality of life. In many studies the PB effects are quantified by amount or volume parameters, such as overall number of counts, minutes being active, or overall energy expenditure. Sometimes these outcomes are clearly affected, but often no or minor effects are found. One of the explanations for this phenomenon is that the overall PB outcomes are not sufficiently sensitive, and that a more detailed quantification of PB components is required. The objective of the presentation is to demonstrate the importance of looking beyond the borders of overall measures of PB.

Methods:

Examples from clinical studies will be presented. These examples mainly come from research from my group and also from external research in the field of rehabilitation medicine.

Results:

The examples will demonstrate that PB is more than just amount and volume, and that a more detailed analysis and quantification of PB may elucidate consequences of diseases and effects of treatment that would have been hidden otherwise.

Conclusions:

Clinically-driven outcomes based on detailed quantification of PB are needed to make objective measurement of PB (more) relevant in clinical research and practice.

S04.2

Physical behavior model and event based analysis - case studies where events provide more information than volume

Authors:

Malcolm Granat

Purpose:

Physical Behavior is the pattern of all free-living physical activities. By quantifying these patterns we can generate an objective measure of a subject's Physical Behavior. A Physical Behavior model will be presented, which incorporates all free-living activities from lying to vigorous activity. Specific examples will be given on how, using event-based analysis, patterns of these events can be analysed to address specific research questions.

Methods:

Continuous seven-day recordings of activity monitor data were obtained from a number of populations. All data was classified into the primary events of upright and sedentary. Upright events were further classified into standing and walking events and sedentary events classified into sitting and lying events. In addition the average cadence of each separate walking event was calculated. Using event-based analysis the patterns of these events were quantified and groups compared.

Results:

Event-based analysis demonstrated that aspects of Physical Behavior could be quantified revealing differences in populations that are not apparent when looking at volumetric data.

Conclusions:

A Physical Behavior model can provide a unified model which can incorporate different aspects of Physical Activity and Sedentary Behavior research. Using event-based analysis it is possible to quantify these behaviors and tailor our outcomes for research constructs.

S04.3

Going beyond the total in understanding sedentary behavior change

Authors:

Genevieve Healy, Samantha Stephens, Elisabeth Winkler, Sebastien Chastin, Stewart Trost, Elizabeth Eakin, David Dunstan

Purpose:

Our series of workplace interventions aimed to decrease sitting time across the day by replacing some sitting (particularly prolonged, unbroken bouts of sitting) with either standing or moving. This presentation will describe how activity monitor data was used to understand not just changes in total sitting time, but also how these changes occurred.

Methods:

The methods used to understand what actually changed (e.g., were there fewer bouts, or just shorter bouts of sitting?), what sitting was replaced with (e.g. standing or stepping), and when the changes happened (e.g., evenly across the whole day or mostly in the morning) will be described.

Results:

In addition to a >2 hour per 8 hour workday reduction in total sitting time, intervention participants also reduced both their number of sitting bouts and their usual bout duration compared to the comparison group. Moreover, they achieved these changes across the day - primarily by replacing long bouts of sitting with long bouts of standing.

Conclusions:

Extending the analysis beyond just the total provides important insights for understanding and promoting behavior change. The methods presented are applicable for use in both epidemiological and intervention activity monitor datasets.

S04.4

Accelerometer-measured physical activity: Importance of total volume per day and standardized measures

Authors:

David Bassett, Rick Troiano, James McClain, Dana Wolff

Purpose:

Use of accelerometers in research studies has increased over the past 25 years. The first accelerometer, the Caltrac, was worn on the waist and estimated physical activity EE (kcal). Subsequently, the emphasis shifted to measuring minutes of moderate-to-vigorous PA (MVPA) done in 10-min bouts. However, light PA and intermittent MVPA also have important health benefits. Thus, it is plausible that, for health benefits, the most important variable is the total volume of PA performed. Total activity counts per day (TAC) is a proxy for the total volume of PA that is more highly related to disease biomarkers than minutes of MVPA per day. Wolff et al. (2013) have developed TAC percentiles for age and gender-specific groups, based on NHANES ActiGraph data (2003-06). TAC is a more direct expression of what the accelerometer actually measures, rather than a derived variable based on regression equations or cut-points. TAC could harmonize PA outcomes across studies, while still allowing researchers to compute other metrics.

S05

Agent-based models for understanding interaction between determinants of PA and dietary intake

Moderator: Frank J van Lenthe, Erasmus MC, Rotterdam, The Netherlands

Presenters: Amy Auchincloss, David Blok, Yong Yang

Discussant: Frank J van Lenthe, Erasmus MC, Rotterdam, The Netherlands

Purpose:

To introduce the application of agent-based models (ABM) in order to improve understanding the interaction between individual and environmental determinants of physical activity and dietary intake.

SYMPOSIA

Rationale:

Following a socio-ecological approach, many studies explore potential environmental and individual determinants of physical activity and dietary intake. There is a complex dynamic relationship between these determinants: People influence their environment and vice versa. This complexity cannot be dealt with properly using conventional statistical approaches. In agent-based models, individuals and their environment interact in a system. Good systems ultimately allow assessing the impact of interventions and policies within the system. This symposium brings the first studies in which agent-based models have been used for this purpose together.

Objectives:

To illustrate the construction and application of ABM for the study of the interaction between individual and environmental determinants of physical activity and dietary intake. To discuss the outcomes of three studies in which agent-based models have been applied. To discuss the possibilities and challenges of agent-based models for research on environmental and individual determinants of physical activity and diet, and to identify other research areas within the field of behavioral nutrition and physical activity in which ABM can be applied.

Summary:

This symposium will start with a background about problems of conventional (regression-based) methods for the purpose of identifying causal environmental and individual determinants of physical activity and dietary intake. Subsequently, three presentations will be given of studies in which an agent-based model has been developed. In the first presentation, a model will be outlined for contextual influences on low dietary quality in the US. In the second presentation, a model will be presented for socioeconomic inequalities in dietary intake in the Netherlands. A third presentation will focus on the application of the model for active travel to school by walking school bus. The three models will allow understanding of the general approach, but will also allow understanding the (rationale for) differences between the models. In the general discussion, the possibilities and challenges of the models will be discussed, as well as the broader application of the agent-based models in the field of behavioral nutrition and physical activity.

S05.1**Agent-based models for studying contextual influences on dietary behaviors****Author:**

Amy Auchincloss

Purpose:

This presentation will illustrate the ways that a new simulation modeling tool, agent-based modeling, can provide insight into contextual influences on low dietary quality. We will discuss when agent-based models may be useful, how they are implemented, and will interpret results from two studies.

Methods:

A simple agent-based model is used to explore complex multilevel feedback processes between food establishments and customers' food purchase behaviors. The model explore interactions that may be influencing the availability of restaurants and food stores, the quality of the food in those establishments, and customer preferences for healthy food and frequency of eating out. The model includes decision constraints and facilitators that involve social influences, initial preferences, frequency of eating out and shopping, and quality of and location of food in the environment.

Results:

Results illustrate under what circumstances healthy foods become more or less prevalent and under what circumstances persons may be more likely to change their dietary behaviors. Model results are contrasted with the types of questions asked and results obtained from empirical work on this topic.

Conclusions:

Challenges and limitations exist for agent-based modeling, nevertheless, use of these dynamic models may complement traditional methods and allow us to ask different kinds of questions and gain additional insights into contextual influences on dietary behaviors.

S05.2

An agent-based model for simulating scenarios of various interventions aimed at the reduction of socio-economic inequalities in diet

Authors:

David Blok, Sake de Vlas, Roel Bakker, Jan Hendrik Richardus, Frank van Lenthe

Purpose:

Individual and environmental factors play an important role in shaping socio-economic inequalities in healthy diet. Agent-based modeling (ABM) is innovative and promising to simulate a system in which individuals and environments influence each other. The purpose of this study is to develop an ABM that describes the socio-economic inequalities in diet and to explore its usefulness to evaluate various interventions aiming at reducing these inequalities.

Methods:

An ABM was developed to simulate people's food shopping and fast food visit behavior within a city. Each household was assigned characteristics such as household type, income and preference for healthy food. Households decide on where to do their groceries (fruit-vegetable store/supermarket/discount supermarket) and when/where to visit a fast food restaurant. Decisions are based on distance, price, and preference for healthy food. Food outlets adapt by closing down or opening a new food outlet. We modeled the city of Eindhoven.

Results:

The model adequately describes the food purchasing and fast food visit behavior of household and the adaptation of food outlets. It is able to evaluate various intervention (e.g. decrease residential segregation, lowering the price of healthy food, health promotion) and can be applied to different settings/cities.

Conclusions:

ABM is a useful complement to current methods for studying the impact of various interventions to support decision-makers.

S05.3

The impact of the Walking School Bus (WSB) on children's active travel to school: An agent-based model study

Authors:

Yong Yang, Ava V Diez Roux, Kelly Evenson, Natalie Colabianchi

Purpose:

We examined the impact of the Walking School Bus (WSB) on children's active travel to school using an agent-based model (ABM) to help demonstrate the conditions under which a WSB is most effective and illustrate the utility of ABMs.

Methods:

An ABM was used to explore how features of the WSB as well as other factors modify the effectiveness of the WSB to increase active transport in children.

Results:

We identified a synergistic effect of the WSB with other interventions, such as an education campaign that increased positive attitudes towards active travel to school (ATS). Results suggest that to maximize ATS, children should arrive on time at "bus stops" to allow faster walking speeds for the WSB. We also illustrated how an ABM can be used to identify the location of routes that maximized the effect of the WSB on ATS.

Conclusions:

ABMs can be used to examine plausible effects of the WSB on ATS under various conditions and to identify ways of implementing the WSB that maximize its effectiveness.

S06

Parental support: What works for low socioeconomic groups and why?

Moderator: Liselotte Schafer, Karolinska Institutet, Stockholm, Sweden

Presenters: Gisela Nyber, Shari Barkin, Clare Collins, Teresia M. O'Connor

Discussant: Tom Baranowski, Baylor College of Medicine, Houston, Texas, USA

Purpose:

To give new insights regarding effective ways to reach and support families with low socioeconomic position in their efforts to promote a healthy diet and physical activity and prevent overweight and obesity in young children.

Rationale:

Overweight and obesity is several times more prevalent in children from low income families giving rise to social inequalities in health in adult life. Social differences in unhealthy eating habits, physical inactivity, overweight and obesity are evident already at an early age, and therefore interventions should start as early as possible and parents should be involved. Understanding how parents influence child behavior is key to the development of effective parental support programmes.

Objectives:

1. Briefly reviewing the literature on effective interventions regarding diet and physical activity in low-income families
2. Present examples of relevant studies from three Western countries
3. Focus on the particular challenges and future opportunities in reaching this target group

Summary:

Dr. Schäfer Elinder will give an overview of the topic and the opportunities and challenges of reaching low-income and minority families. This will be followed by four speakers, the first two of whom will present results from RCT studies: One parental support programme, provided in the school setting, to promote healthy dietary and physical activity habits (Dr. Nyberg) and one family-centered community-based intervention to prevent obesity (Dr. Barkin). This will be followed by a study on implementation of a dietary after-school programme including a nutrition component for parents (Dr. Collins). The final presenter will discuss results from a cross-sectional study on factors influencing parenting practices that encourage and discourage physical activity (Dr. O'Connor). Dr. Baranowski will summarise the presentations and lead the discussion.

S06.1

Effectiveness of a universal parental support programme to promote healthy dietary and physical activity habits in six-year-old children in low-income areas - a Healthy School Start II

Authors:

Gisela Nyberg, Elinor Sundblom, Åsa Norman, Liselotte Schäfer Elinder

Purpose:

To study the effectiveness of a universal theory-based parental support programme targeting children's dietary habits, physical activity and body weight in low-income areas in Stockholm county, Sweden.

Methods:

Participants were six-year-old children (n=378) and their parents. In total 31 pre-school classes were included and cluster-randomised to intervention (n=16) and control group (n=15). The intervention lasted for 6 months and is based on Social cognitive theory with parental self-efficacy as a mediator. The programme theory included three components: 1) Health information material, 2) motivational interviewing with the parents and 3) teacher-led classroom activities with the children. The programme has been tested in an area with mixed socio-economy in an RCT and the results are promising. Based on these findings we adjusted the programme and have just finished a second round of evaluation in municipalities with a high proportion of inhabitants with a low socio-economic background. The outcomes are children's physical activity measured by accelerometry, dietary habits measured by a validated questionnaire, and measured body weight and height. Parental self-efficacy is measured with a validated questionnaire. Measurements

were conducted at baseline, post-intervention and 6-months follow-up. Group differences were analysed with ANCOVA, adjusted for cluster, gender and baseline values.

Results:

We are currently analysing data and results of the effectiveness of the programme will be presented.

Conclusions:

Assuming that the programme shows positive results, is feasible and cost-effective, we propose that it could be implemented nationally within school health care contributing to a reduction in social inequalities in health.

S06.2

Parents as partners for pediatric obesity prevention in preschoolers

Author:

Shari Barkin

Purpose:

Growing Right Onto Wellness (GROW) is an RCT testing the efficacy of a family-centered, community-based, behavioral intervention to prevent childhood obesity among preschool-aged children. Focusing on parent-child pairs, GROW utilizes a multi-level framework, accounting for macro and micro level systems that contribute to the childhood obesity epidemic.

Methods:

600 parent-child pairs will be randomized to a 3-year healthy lifestyle intervention (addressing the health the parent and the child) or a 3-year school readiness program. Eligible children are 3-5, are from minority communities, and not obese. Only children at-risk for obesity (BMI $\geq 50\%$ but $< 95\%$ but not yet obese) are included. The principle site for the GROW intervention is local community recreation centers and libraries. The primary outcome is childhood body mass index (BMI) trajectory at the end of the three-year study period. Secondary outcomes include parental outcomes, weight change and physical activity. In addition to other anthropometric measurements, mediators and moderators of growth are considered, including genetics, accelerometry, and diet recall. The first two years of the program assessed physical activity of preschool age children in their built environment, captured through geographic information systems and the associated activity levels of their participating parent.

Results:

We will present data on both the child and parent from the formative phase of this program, currently under analysis.

Conclusions:

By conducting this trial in public community centers, and by implementing a family-centered approach to sustainable healthy childhood growth, we aim to develop an exportable community-based intervention to address pediatric obesity.

S06.3

Can an efficacious child obesity RCT be translated to meet the needs of a socio-economically disadvantaged community? The Back to Basics (B2B) after-school program

Author:

Clare Collins

Purpose:

Few efficacious child obesity interventions have been translated to community programs. We aimed to meet the needs of parents and children (5-12 years) from a socio-economically disadvantaged community in the Hunter, NSW, Australia and evaluated the impact of Back to Basics (B2B) cooking club on constructs of Social Cognitive Theory (SCT), including self-efficacy to prepare and eat vegetables, after 6 months.

SYMPOSIA

Methods:

Following community consultation, B2B key messages were delivered through a five session after-school cooking club for children, with a brief evidence-based nutrition component for parents. B2B includes 5 x 90mins cooking sessions with a 30 minute practical nutrition activity for parents to reinforce healthy eating at home, taste the meal children prepared and provide a 'vegetable of the week' to repeat the recipe at home. Data on SCT constructs were assessed by interviewer administered questionnaire. Effect size was calculated using Cohen's d analysis and assessed as small $d < 0.50$, moderate 0.50 or large 0.80.

Results:

The proportion consuming fruit at least daily increased, but vegetables with the evening meal did not change. Child SCT scores increased with a moderate to large effect size. Mean [SD] scores for self-efficacy to prepare/eat vegetables (adjusted diff = 4.43[5.8], Cohen's $d = .76$), social environment (5.75[4.8], $d = 1.2$) and self-control (4.55[6.9], $d = 1.04$).

Conclusions:

An after-school cooking club with a parental nutrition component is acceptable to families in a low SES community. Parents were engaged in the intervention and able to modify some aspects of child dietary intake.

S06.4

Environmental and cultural correlates of physical activity parenting practices among Latino parents with pre-school-aged children

Authors:

Teresia O'Connor, Ester Cerin, Rebecca Lee, Nate Parker, Tzu-An Chen, Sheryl Hughes, Tom Baranowski

Purpose:

Parents can influence their children's PA through parenting practices (PP). Correlates of PA-PP have not been investigated. This study therefore aimed to examine the independent contributions of (1) socio-demographic, (2) cultural, (3) parent perceived-environmental, and (4) objectively-measured environmental factors, to PP that encourage or discourage preschoolers' PA in a Latino sample of parents.

Methods:

A cross-sectional study of Latino parents ($n=240$) was conducted. Validated scales assessed: Sociodemographics; cultural variables (acculturation, familism); and perceived environmental variables (signs of disorder, traffic safety, stranger danger, neighborhood informal social control, active play equipment availability, and children's PA places). Participant's home address was linked to objective crime and traffic risk indices based on census block groups. The preschoolers PA-PP instrument measured the two dependent variables: A) Encouraging child PA-PP with one sub-scale (engagement/structure), and two single items (outdoor toy availability; sports registration); and B) Discouraging child PA-PP with 4 subscales: Promote inactive transport, promote screen time, psychological control, and safety concerns. Hierarchical regression models were built in four contributory steps. The total explained outcome variance (R^2) was computed for each set of predictors to a particular PP sub-factor.

Results:

Significant correlations to PA-PP included: Socio-demographics with outdoor toy availability, psychological control, and promotion of inactivity; Cultural factors with safety concerns; Perceived environmental attributes with five of seven PP; and Objectively-measured environmental attributes with none of the PP.

Conclusions:

Interventions promoting PA among Latino preschoolers may need to address parent's environmental perceptions to effectively promote PA-PP that encourage PA while reducing PA-PP that discourage PA.

SYMPOSIA

S07

Environmental correlates of physical activity among older adults

Moderator: Richard G. Prins, Erasmus Medical Center, Department of Public Health, Rotterdam, The Netherlands

Presenters: Ester Cerin, Astrid Etman, Jacqueline Kerr, Lea Maes

Discussant: Carlijn B.M. Kamphuis, Erasmus Medical Center, Department of Public Health, Rotterdam, The Netherlands

Purpose:

The reason for this symposium is to present and discuss innovative studies - from three different continents - which give insights in the relationship between environmental factors and physical activity behavior among older adults.

Rationale:

Physical activity contributes to healthy aging and health among older adults. Despite this, high numbers of older adults are not physically active enough. Socio-ecological and environmental models hypothesize a relationship between the objectively measured physical environment and physical activity, however according to recent reviews, evidence for such a relationship is scarce - especially among older adults. To make a public health impact, better insight in environmental influences on physical activity is of utmost importance. In this symposium new findings will be presented from different studies that have taken place in Europe, Asia and the US. Each of the studies takes an innovative approach to derive at better evidence for the hypothesized associations between environmental factors and physical activity. Specifically, in this symposium the use of new environmental factors, choice of buffer sizes, and the use of SenseCam technology will be discussed.

Objectives:

- 1) Provide insight in objectively measured environmental factors that may influence older adults' physical activity, by presenting novel studies from various continents;
- 2) Present innovative ways to study environmental correlates of PA among older adults;
- 3) Integrate and discuss research findings from different continents (Northern America, Asia and Europe)

Summary:

First, an overview of the current state of the evidence regarding environmental influences on physical activity among elderly will be given by the Chair of this session (Rick Prins), followed by an introduction of the topics of the individual contributions. Ester Cerin will discuss research from Hong Kong on associations between diversity and the number of destinations with transport-related walking among older adults. In addition, she will show moderation effects of safety and infrastructure-relation neighbourhood attributes on these associations. Astrid Etman will continue with a presentation on the association of environmental characteristics within three different buffer sizes and walking among a sample of Dutch older adults. Subsequently, Jacqueline Kerr will discuss about the opportunities SenseCam and accelerometers offer in studying associations between environmental factors and physical activity. Finally, Carlijn Kamphuis (discussant) will integrate the research findings from different continents - highlighting similarities and differences.

S07.1

Walking for transportation in Hong Kong Chinese urban elders: A cross-sectional study on what destinations matter and when

Authors:

Ester Cerin, Ka-yiu Lee, Anthony Barnett, Cindy Sit, Man-chin Cheung, Wai-man Chan, Janice Johnston

Purpose:

Identifying destinations and environmental conditions that facilitate walking for transport has public health significance. We investigated relationships of within-neighborhood objectively-measured destinations and environmental attributes with transport-related walking in elders from an ultra-dense metropolis (Hong Kong).

Methods:

We estimated relationships of diversity and prevalence of destination categories (environmental audits of 400m buffers surrounding residential addresses) with transport-related walking in 484 Chinese-speaking elders able to walk unas-

sisted and living in neighborhoods varying in socio-economic status and transport-related walkability. We examined the moderating effects of safety and pedestrian infrastructure-related neighborhood attributes on destination-walking associations.

Results:

The prevalence of public transit points and diversity of recreational destinations were positively related to overall transport-related walking. The presence of a health clinic/service and place of worship, recreational destinations diversity, and greater prevalence of non-food retails and services, food/grocery stores, and restaurants in the neighborhood were predictive of more within-neighborhood transport-related walking. Neighborhood safety-related aspects moderated the relationship of overall transport-related walking with the prevalence of public transit points. Moderating effects of safety-related attributes were observed for the relationships of within-neighborhood transport-related walking with recreational and entertainment destinations. Pedestrian-infrastructure attributes acted as moderators of associations of within-neighborhood transport-related walking with prevalence of commercial destination categories.

Conclusions:

The availability of both non-commercial and commercial destinations may promote within-neighborhood transport-related walking, while recreational facilities and public transit points may facilitate overall transport-related walking. However, destination-rich areas need to also provide adequate levels of personal safety and a physically-unchallenging pedestrian network.

S07.2

Neighborhood characteristics and transportational walking among frail and non-frail Dutch elderly: Does the size of the buffer zone matter?

Authors:

Astrid Etman, Carlijn Kamphuis, Rick Prins, Alex Burdorf, Frank Pierik, Frank van Lenthe

Purpose:

A neighborhood supportive for walking may facilitate elderly to live longer independently. However, current evidence on neighborhood characteristics potentially important for walking among older persons is mixed. This study hypothesized that the importance of neighborhood characteristics for transportational walking depends on the buffer size for which neighborhood characteristics are measured, and older adults' frailty level.

Methods:

The study population consisted of 408 Dutch community-dwelling persons aged 65 years and older participating in the Elderly And their Neighborhood (ELANE) study in 2011-2012. Associations between neighborhood characteristics (aesthetics, functional features, safety, and destinations) obtained through street audits and self-reported transportational walking time were tested for four walking path network buffer zones, and by level of frailty, using linear regression analyses.

Results:

An increase of functional features (e.g. presence of sidewalks and benches) within a 400 meters buffer, of aesthetics (e.g. absence of dog waste and graffiti) within 800 and 1200 meters buffers, and an increase of one destination per buffer of 400 and 800 meters were associated with increases in transportational walking among the elderly up to 2.89 minutes per two weeks (CI 1.07-7.32; $p < .05$). No differences in these associations were found between frail and non-frail persons.

Conclusions:

An aesthetic environment, functional features, and destinations were associated with more transportational walking among community-dwelling older persons. The importance of neighborhood characteristics for transportational walking differed by buffer zone size, but not by frailty level. Neighborhood improvements may increase transportational walking among older persons, thereby contributing to living longer independently.

S07.3

New objective measures for assessing physical activity and eating environments in older adults

Author:

Jacqueline Kerr

Purpose:

To investigate the use of person worn Sensecam images in older adults to assess social and physical environments and eating and activity behaviors. Person worn image data provides greater contextual information than GIS or street audits and includes photos inside the home. Photos of fridge contents for example could be important for a nutrition intervention. Photos of other people can indicate social interactions. Photos of exact food and activity locations can validate GIS or audit data sources. Photos record indoor vs outdoor activity. Photos also indicate physical activity behaviors, activities of daily living, sedentary behaviors and eating. Further, Sensecams were designed to aid recall in older adults and can be used to supplement interviews for activity or eating.

Methods:

Older adults 60-90+ years old wore a Sensecam, accelerometer and GPS device for 6 days and completed standard surveys. A protocol for coding 17 activities including driving, watching TV, household tasks, and physical activity was developed and reliability established. Annotation rules for social interactions, built environment features and indoor outdoor locations were also developed.

Results:

Over 70 older adults consented to participate and wear the study devices. Recruitment and compliance rates were high. The SenseCam collected 1000s of images per person each day. The images were successfully coded, with each day of data taking about 3 hours to code. The images suggested that accelerometer data were misclassifying physical activity and sedentary behavior.

Conclusions:

The SenseCam is a useful tool to assess multiple behaviors and environments and provides additional contextual data.

S08

Dietary behavior and weight control in adults and children: The influence of psychological factors

Moderator: Carmen Keller, ETH, Zurich, Switzerland

Presenters: Britta Renner, Simone Dohle, Carmen Keller, Emily de Vet

Discussant: Carmen Keller, ETH, Zurich, Switzerland

Purpose:

In most Western countries, energy-dense foods are easily available everywhere and most of the time. Research has indicated that people do not make only self-regulated and deliberate food choices. Instead, people's eating behaviors are often impulsive, affective, non-intended and unconscious. In an obesogenic food environment, these behaviors may result in overconsumption of unhealthy food. This symposium identifies personality and social psychological factors that facilitate unconscious and affective food choices that could result in overconsumption and overweight. Innovative changes in the food environment (nudges) are presented that facilitate healthy choices.

Rationale:

In an obesogenic environment, impulsive and unconscious food choices may result in overconsumption and overweight. Studies using different approaches, methods and samples of adults and children may help to reveal these effects and to share knowledge about beneficial prevention strategies for increasing resilience to the obesogenic environment.

Objectives:

The symposium provides a better understanding of psychological influences on eating behavior, overconsumption and weight control. Innovative nudges to create a food environment that facilitates healthy food options are presented. New insights for improving food choices and prevention strategies that take differences in personality, the social environment and the food environment into account are discussed.

Summary:

From different psychological perspectives, three experimental studies and one survey examine unaware or unintentional influences on food choices and weight control: The question of how popular or unpopular peers (social images) influence children's eating is examined; the effect of overvalued self-prepared food on overconsumption and the role of dispositional self-control for successful and unsuccessful restrained eating and weight control are clarified. An experiment examines nudges that make the healthy choice the default choice for people low in self-control. Results of the studies increase knowledge about the psychological background of eating behavior and weight control and provide new insights for developing promising prevention strategies.

S08.1**The impact of social images on spontaneous food intake: We eat what others eat****Authors:**

Britta Renner, Diana Taut, Adriana Baban, Harald Schupp

Purpose:

Imagine Lady Gaga happily eating a hamburger. Since she is a popular celebrity, her social image reflects on the food she is eating. According to the assumption that food is a way to acquire a positive social image, interventions were developed and their impact on spontaneous intake behavior was tested.

Methods:

The two interventions comprised an implicit positive (popular peer) or an implicit negative (unpopular peer) social image approach. Within each intervention, children were randomized to either a control, a healthy or unhealthy eating condition.

Results:

The valence of the social image impacted food intake significantly. Importantly, inducing an image of a popular peer eating unhealthy induced an indulge effect (84% started to snack). Conversely, inducing an image of a popular peer eating healthy had the opposite effect (30% started to snack).

Conclusions:

Healthy eating behavior can be facilitated effectively through implicit non-health related interventions based on social images.

S08.2**The "I cooked it myself" effect: Food preparation increases liking and consumption****Authors:**

Simone Dohle, Sina Rall, Michael Siegrist

Purpose:

Research has demonstrated that people like and overvalue objects that they have created themselves. This phenomenon appears to be a very basic process and might be best explained as effort justification. In the present study, whether preparing food increases the liking for and consumption of food was examined.

Methods:

In the randomized experiment, participants (N = 60) tasted a raspberry milkshake. The milkshake (425 kcal) contained 120g of raspberries, 100ml of milk (2.5% fat), 80ml of cream, and 10g of sugar. The milkshake that was either self-prepared or other-prepared, i.e., prepared by the experimenter.

Results:

The self-prepared milkshake received higher liking ratings than the other-prepared milkshake. In addition, participants who prepared the milkshake themselves consumed a larger quantity of the shake. In fact, self-preparing caused participants to consume approximately 78 calories more compared to participants who consumed the ready-to-drink

milkshake. Further analyses indicated that this effect was mediated by liking; thus, participants consumed more of the self-prepared shake because they liked it more.

Conclusions:

The results show that the mere act of preparing food increases liking and consumption. We refer to this phenomenon as the “I cooked it myself” effect. In addition, the study suggests that the mere act of preparing food could facilitate the overconsumption of high-calorie foods and provides preliminary information that may guide the design of future experiments on food preparation and consumption.

S08.3**Successful and unsuccessful restrained eating: Does dispositional self-control matter?****Authors:**

Carmen Keller, Michael Siegrist

Purpose:

A food-rich environment poses a challenge to people who restrain their food intake in order to control weight. Research has shown that restrained eaters are at the same time most tempted by energy-dense foods. Thus, only a few restrained eaters are able to successfully control their weight in the long run. This study examined whether individual differences in dispositional self-control can explain restrained eaters' success in controlling their weight.

Methods:

A survey was conducted in a random sample (N=1078) from the general population.

Results:

A regression analysis with body mass index (BMI) as dependent variable revealed a significant negative effect of dispositional self-control, and a significant positive effect of dietary restraint. These effects were qualified by a significant interaction between restraint and self-control. Among restrained eaters, the association between self-control and BMI was significantly more negative than among normal eaters. Furthermore, restrained eaters with high dispositional self-control had a normal weight (BMI < 25); those with low dispositional self-control were overweight (BMI > 25).

Conclusions:

High dispositional self-control facilitates successful restrained eating. It is a psychological resource whereby individuals in a food-rich environment resist eating too much of the tempting foods around them.

S08.4**Can subtle re-arrangements of choice options improve food choice: A nudge example****Authors:**

Emily de Vet, Denise de Ridder

Purpose:

Psychological research demonstrated that people often do not make reasoned food choices. Nudges, defined as simple changes in the presentation of choice alternatives use this knowledge to make the healthy choice the default choice. We examined re-arrangement of choice options as a particular kind of nudge, so that the naturally preferred middle choice reflects the healthiest choice under low and high self-control conditions.

Methods:

A 2 x 3 between-subjects experiment was conducted among 179 students. First, a task to deplete self-control resources was administered among half of the participants. The other half completed a filler task. Next, students were presented a choice between soft drinks. Control group participants were presented glasses containing, from left to right, 200, 300, and 400 ml. Nudge group participants were presented the same glasses, but in a different order from left to right, 300, 200 and 400 ml. The third group was presented an extra choice option; 100, 200, 300, and 400 ml. Choices were dichotomised into healthy (100 or 200 ml) or unhealthy (300 or 400 ml).

SYMPOSIA

Results:

Self-control depletion did not affect choice, but presentation of choice options did. Participants in both conditions (re-arrangement and expanding the choice range) were significantly more likely to select a smaller sized drink than control group participants. Self-control and choice options did not interact.

Conclusions:

The results show that nudges bear potential to make the healthy choice, the easy choice, including for those who rely on impulsive decision making (low self-control).

S09***Approaches to measuring parenting in the child and adolescent eating context***

Moderator: Louise Masse, University of British Columbia, Vancouver, BC, Canada

Presenters: Teresia O'Connor, Allison Watts, Sheryl Hughes, Christine Blake

Discussant: Steff Kremers, Maastricht University, Maastricht, The Netherlands

Purpose:

The purpose of this symposium is to improve our understanding of food parenting practices so that we can ultimately improve our measurement methods. The symposium will start by reviewing food parenting practice items previously used to measure constructs and through novel data collection methods (i.e., direct observation, photovoice, card sorting) will highlight specific areas of food parenting to determine the extent to which our measures have incorporated or focused on important parenting practices.

Rationale:

The household environment plays a critical role in shaping children and adolescents eating behaviors; however, there is little consistency as to how food parenting practice is measured. It is crucial to improve our measurement methods to further understand the mechanisms through which parenting practices influence children/adolescents eating behaviors. The presentations will provide a broad understanding of parent- child interactions within the eating context which can ultimately serve to refine current measures of food parenting.

Objectives:

To 1) review food parenting practices items currently used in published measures to determine areas that have been priorities in measuring food parenting practices; 2) understand from children/adolescents' perspective the factors that impede or facilitate healthy eating in the home environment; 3) understand child snacking from the parent perspective and its use in different feeding contexts; and 4) determine the validity of a questionnaire to adequately capture the emotional climate during mealtimes with parent/child interactions. Finally, the talks will be integrated to determine the extent to which current food parenting measures captures the eating context themes identified in the talks.

Summary:

The chairperson will start the session with a brief introduction to highlight the need to standardize measures of food parenting. The first speaker will present results from a review of literature to highlight areas of parenting that have been prioritized in current measures. The next three speakers will highlight how their novel data collection techniques uncover new areas to incorporate in food parenting measures. The discussant will integrate the measurement issues highlighted in all the talks to provide further directions in standardizing the measurement of food parenting.

S09.1

Description of a food parenting practice item bank

Authors:

Teresia O'Connor, Truc Pham, Sheryl Hughes, Allison Watts, Tom Baranowski, Louise Mâsse

Purpose:

Several recent reviews have highlighted the large number of instruments currently available to assess food parenting practices (FPP). In order to foster development of instruments that assess behaviorally significant FPP domains with appropriate items, an item bank of FPP is being developed, populated by published items and items reported by parents as important in influencing children's eating behaviors. Here, our aim was to describe the databank of published items.

Methods:

Published FPP instruments were identified from published reviews and supplemented with additional instruments identified via a systematic review of recent publications. Articles that provided psychometric properties of new scales or modifications of existing scales were included. Sample and psychometric information was extrapolated and linked to the published FPP constructs and items. Items were coded at two levels with 19 primary and 1-6 secondary FPP constructs along with the primary food identified.

Results:

103 articles, including 75 unique instruments were entered into the databank that yielded 1,892 items. The constructs with the largest number of items were Structure of Eating Environment (196 items) and Food Availability/Accessibility (176 items), which included 188 and 166 unique items (exact duplicates deleted) respectively. The constructs with the least number of items were Redirection (1 item) and Covert Control (9 items, 8 unique items).

Conclusions:

This comprehensive item bank represents a synthesis of multidisciplinary instruments assessing FPP. Future work will need to examine the factorial and criterion validity of the items and resulting constructs and major gaps of constructs or items that require further development.

S09.2

Overweight and obese adolescents' perspectives on factors that impede or facilitate healthy eating within the home environment

Authors:

Allison Watts, Chris Lovato, Susan Barr, Louise Mâsse

Purpose:

The purpose of this study was to explore perceived factors that impede or facilitate healthy eating within the home environment among overweight/obese adolescents. Gaining a better understanding of the influence of the household environment may help improve the success of behavioral interventions targeted at overweight/obese adolescents and their families.

Methods:

A photovoice study was conducted with 22 overweight/obese adolescents who participated in a family-based lifestyle modification intervention. Adolescents were instructed to take pictures of things that made it easier or harder to make healthy food choices at home over a 2-week period. Digital photographs were reviewed, and semi-structured interviews were conducted to give participants an opportunity to talk about their photographs. All audio recorded interviews were transcribed and analyzed in NVivo using constant comparative analysis. Three independent researchers took part in data coding and interpretation.

Results:

The mean age of participants was 14 years ($SD=1.9$), 77% were female, their mean BMI z-score was 2.2 ($SD=0.7$), and 56% were white. Adolescents talked about nine different areas of the home environment that influenced their eating

habits (in order of frequency): Availability, parental control, home cooking, modeling, celebrations, accessibility, family structure, meal routines, parental encouragement and screen use/studying. Within these areas, adolescents talked with equal intensity about both barriers and facilitators to healthy eating in the home environment.

Conclusions:

Adolescents struggled to make healthy choices in their home environment but they highlighted parenting strategies that appeared promising. Targeting the home food environment is essential for enabling healthier food choices among overweight/obese adolescents.

S09.3

Direct observation of feeding styles among low-income families

Authors:

Sheryl O. Hughes, Thomas G. Power, L. Suzanne Goodell, Susan Johnson

Purpose:

Parenting plays a significant role in the development of eating behaviors that contribute to childhood obesity. Most feeding assessments rely on maternal self-report. Since self-report has known biases (social desirability and recall), our aim was to further validate the Caregiver's Feeding Styles Questionnaire (CFSQ) through direct observation.

Methods:

Participants were Head Start mothers and their preschooler who were videotaped in their homes during dinner. Eighty families were chosen from a larger study to create a 2 X 2 X 2 design: Ethnicity (African-American; Hispanic) X child weight status (normal; overweight/obese) X child gender. Videotapes were coded using an in-depth coding system adapted from Baumrind and Black (1967). Employing event coding, all maternal attempts to influence the child and child attempts to influence the mother were coded (verbal and non-verbal behaviors). Mothers completed the CFSQ.

Results:

Results showed that feeding styles (FS) based on self-report differed in observed behavior during dinner. Authoritarian mothers were more likely to encourage the child to eat and force compliance, whereas authoritative mothers were more likely to use low directive strategies such as hints and suggestions. Authoritative mothers were more likely to engage in non-influencing dinnertime conversation. Uninvolved mothers were most likely to use unelaborated commands in directing child behavior.

Conclusions:

Few studies to date have examined the convergence of self-report and behavioral observation during feeding. To develop effective childhood obesity prevention programs, it is important to know what actually takes place during parent-child eating episodes. Questionnaires validated with direct observation measure behaviors beyond intentions.

S09.4

Integrating card-sort and qualitative interview methods to understand parents' child-snack schemas

Authors:

Christine E. Blake, Jennifer O. Fisher, Nicholas Younginer, Alex Orloski, Rachel Blaine, Heather Hamtil, Yasmeen Bruton, Kirsten K. Davison

Purpose:

Snacking is a potential contributor to excessive energy intake, particularly among low-income, minority populations who are disproportionately vulnerable to obesity. Despite its public health significance, the evidence to guide promotion of healthy snacking among children is lacking. This study used a novel mixed-methods approach drawing on cognitive schema theory to gain a conceptual understanding of child snacking from parents' perspective.

Methods:

Sixty low-income parents (20 AA-20 Hispanic-20 White) of children aged 3-5 from two Northeastern US cities participated in interviews that integrated card-sort and qualitative interviewing methods. Cards depicted 65 typical preschooler

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snacks varying in SoFAS (Solid Fats Added Sugars) content. Card-sort data were analyzed to identify predominant categories and commonalities in snack items assigned to each category. Qualitative data were analyzed using thematic coding to contextualize results from card-sort data. Data were analyzed separately and then compiled across racial-ethnic groups.

Results:

Findings from this integrated approach allowed for delineation of parents' snack definitions, contexts, and purposes and snacking-related feeding practices. Interviews and card-sorts revealed a range of snacking contexts (e.g., home, car, doctor's office) that varied in types of snacks offered (card-sort) and practices employed (interview). Card-sorts indicated high agreement on the main purposes for snacks (e.g. reward, "hold-over", hunger) but inclusion of foods in these card-sort categories and corresponding practices described in interviews varied.

Conclusions:

Using an approach that integrates card sorting with qualitative interviewing provides a holistic understanding of parents' concepts of child snacking that is important for development of successful healthy snacking promotion efforts.

S10

Value of green space for physical activity

Moderator: Jenny D Veitch, Deakin University, Victoria, Australia

Presenters: Ruth Hunger, Jenny Veitch, Jasper Schipperjin, Aaron Hipp

Discussant: Neville Owen, Baker IDI Heart and Diabetes Institute, Melbourne, Australia

Purpose:

Green space is an important setting for physical activity as parks can provide a local destination for people to walk to and be active within. Access to attractive and large green space is associated with increased levels of walking and overall physical activity. Providing green environments supportive of physical activity is particularly relevant given that population-wide physical activity levels are low across the world. Information on park use and the value of parks to the community is required to support further policy and intervention development. Research is required to provide policy makers, planners and public health practitioners with information on how to plan and design green spaces and interventions to optimize the value and use of parks for physical activity and health benefit.

Rationale:

Green spaces are associated with physical activity, but to move the research and policy for green spaces forward, new studies focusing on causal relations are needed. This symposium will provide an overview of the state of the research in the field and discuss future directions.

Objectives:

The aim of this symposium will be to present current evidence of the importance of green space for physical activity, the methods for measuring green space use as well as providing insight into the current challenges, opportunities and implications for future research. This symposium will identify existing evidence gaps, provide a platform for guiding future research through a developed framework for intervention research and isolate opportunities for cross-country collaborative studies.

Summary:

This symposium will provide an international perspective on the value of green space for physical activity and will include speakers from the UK, Australia, Denmark and the USA. The presentations will provide an overview of physical activity and green space research. This is important and novel as it will show where the field is heading and what research questions still need to be addressed.

S10.1

Physical activity interventions and urban green space: An evidence review and framework for action

Authors:

Ruth Hunter, Thomas Astell-Burt, Hayley Christian, Jasper Schipperijn, Jenny Veitch

Purpose:

To undertake an evidence review to assess the effectiveness of interventions to encourage physical activity (PA) in urban green space (UGS), and develop a framework for designing, implementing and evaluating PA interventions in UGS.

Methods:

Five databases were searched (Medline, EMBASE, CINAHL, Sport DISCUS, PubMed) independently by two reviewers using search terms relating to 'physical activity', 'urban green space' and 'intervention'. Eligibility criteria included (i) intervention to encourage PA in UGS which involved either a physical change to the UGS (e.g. new play park) or an intervention to promote use of UGS (e.g. green prescription schemes); (ii) primary outcome measure of PA; (iii) at least one endpoint. Studies were categorised using the socio-ecological model to define interventions targeted at individuals, community, organisations or population level.

Results:

Of the 2403 publications identified, 18 were included. In summary, we found that there was a paucity of robust evidence to support the effectiveness of PA interventions to encourage the use of UGS for all levels of the socio-ecological model. Based on the review we identified gaps in the literature, highlighted recommendations for future research in terms of study design, comparable measures of PA and UGS, and highlighted challenges and future directions.

Conclusions:

This review highlights the dearth of research investigating the effectiveness of PA interventions in UGS. More robust evaluations of interventions to promote the use of UGS are urgently required. This framework provides a platform for guiding the design, implementation and evaluation of future research investigating PA interventions and UGS research.

S10.2

Physical active use of elements of urban green space

Authors:

Jasper Schipperijn, Michael Lindberg

Purpose:

Examine the physical activity (PA) levels during use of specific elements of urban green space (UGS). UGS, and more specific the number of elements in UGS has been associated with PA. However, more detailed studies of which elements generate high levels of PA, for which type of users, are relevant as existing knowledge is scarce and inconclusive.

Methods:

Using the System for Observing Play and Recreation in Communities (SOPARC) we examined the use of four different UGS and the use of 36 elements. Face-to-face interviews with the UGS architects were conducted to reveal the predetermined target groups of the elements.

Results:

Elements that provide the opportunity for games and playing activities are more used for PA than elements directed at individual training of strength and fitness. The opportunity for socializing and playing while being physically active seems important for many users. A variation in elements arranged at one place, as well as the design and quality of elements, have an impact on use of elements. Furthermore, males are more vigorously active than females when using elements. Use of some elements did not match the predetermined target groups and aesthetics were mentioned as a key factor when designing elements.

Conclusions:

Our results provide important knowledge to architects, planners and policy makers when aiming at designing activity-promoting elements in UGS. Future studies need to further investigate the use of elements among specific target groups, particularly females, and make this information more accessible to planners and architects.

S10.3**Use of MapMyRun to understand location preferences for urban running trips****Authors:**

Aaron Hipp, Deepti Adlakha

Purpose:

Evidence shows regular physical activity (PA) and time outdoors are effective strategies for preventing obesity in people of all ages. This presentation analyzes MapMyRun web data feeds to assess the use of St. Louis, MO, parks for bouts of running and to identify if this PA occurs in areas with diverse socioeconomic status (SES).

Methods:

We downloaded running routes submitted by users of the website and smartphone application MapMyRun that enables participants to track their running routes, distance, and time. We used a random number generator to randomly download one mapped run per calendar day during 2012. We visually illustrated the routes using GIS and analysed the location of routes using a St. Louis parks shapefile and Missouri 2010 Census Tract data SES data.

Results:

Initial results show 80.8% of mapped runs in St. Louis, MO, in 2012 occurred at least partially within or tangential a public park. 30.2% of total miles run in 2012 were within or tangential a park. Runs occurred across diverse neighborhoods with the range of percent poverty being 1.6 - 39.9%. However, compared to the region as a whole runs occurred in significantly less impoverished neighborhoods (15.9% and 26.1% poverty; $t:6.57$, $p<0.001$).

Conclusions:

This work represents an initial, novel effort to use public web data feeds (MapMyRun) to better understand population level PA behaviors in outdoor and park settings. The use of public web data feeds and other emerging sources of PA data (outdoor webcams) hold much promise but currently lack thorough validation.

S10.4**Methodological considerations in the design of natural experiments****Authors:**

Jenny Veitch, Jo Salmon, Alison Carver, Elly Fletcher, David Crawford, Billie Giles-Corti, Anna Timperio

Purpose:

Natural experiments are a research priority for investigating causal associations between the built environment and physical activity; however, they are rarely conducted. Parks are important settings for physical activity and opportunities to conduct natural experiments in this setting are critical. This presentation will review the various methodologies conducted in a park natural experiment and present baseline data on park use.

Methods:

REVAMP is a natural experiment study that is examining the impact of park renewal in a large regional park in Victoria, Australia on park use and park-based physical activity and whether behavioral changes are maintained over time. Baseline measurements were conducted at the intervention park as well as a control park in 2013 and included: Interviews with park users ($n=794$); electronic recording of path usage and cars entering the parks; and cross-sectional surveys with local residents ($n=1488$). At each park, observations of park users were also conducted hourly using the System for Observing Play and Recreation in Communities (SOPARC) on four weekdays (7.30am-4.30pm) and four weekend days (8.30am-4.30pm).

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Results:

In total, 4756 park users (23% children, 7% teens, 53% adults, 16% seniors) were observed. 57% of children, 32% of teens, 33% of adults and 30% of seniors were observed engaging in moderate or vigorous physical activity. Methodological challenges included timing of data collection, weather, conflicting park events, and placement of observers.

Conclusions:

This study will inform future natural experiment studies and park renewal developments that aim to increase park-based activity and improve the health of park users.

S11

Integrating approaches to prevent and control child obesity: The CORD Project

Moderator: Ashleigh May, CDC

Presenters: Guadalupe Ayala, Deanna Hoelscher, Kirsten Davison, Daniel O'Connor

Discussant: Knut-Inge Klepp, Norwegian Directorate of Health, Oslo, Norway

Purpose:

The purpose of this symposium is to describe the Childhood Obesity Research Demonstration (CORD) Project, a multi-site study in the U.S. designed to determine the effectiveness of integrating clinical and public health approaches to obesity prevention using the Obesity Chronic Care Model as a framework.

Rationale:

Although childhood obesity is a significant public health problem in the U.S., few intervention programs effectively reach at-risk low-income populations. Evidence suggests that multi-level, multiple setting approaches can serve to reinforce and promote behaviors that lead to healthy child weight; however, linkages between levels and settings often have been weak or non-existent. In particular, linkages between the healthcare system and interventions in other settings are not clearly delineated. The CORD Project, funded through the Affordable Care Act, launched three community-based demonstration projects that are implementing different interventions to achieve this goal among youth aged 2-12 years, with outcome evaluation including child body mass index (BMI), behavior change, and healthcare utilization.

Objectives:

Through attendance at this symposium, participants will be able to:

1. Describe the background and rationale for development of the Childhood Obesity Research Demonstration (CORD) Project.
2. List the CORD project sites and contrast the different intervention approaches.
3. Describe the framework for the overall evaluation of the CORD projects.
4. Compare and contrast the CORD project with international efforts to prevent and control childhood obesity using an integrated clinical and public health model.

Summary:

Several members of the U.S. Department of Health and Human Services, including the Centers for Disease Control and Prevention (CDC), developed CORD as a community-based model to decrease child obesity in children ages 2-12 years from low-income families. All CORD projects were required to include evidence-based intervention programs that targeted multiple settings, such as the healthcare system, early care and education centers, schools and the community at large, and involved community health workers. Three CORD projects were funded at geographically diverse sites with existing childhood obesity coalitions, along with an Evaluation Center to coordinate data analysis and a cross-site evaluation. This symposium will describe the three CORD projects, as well as discuss how the CORD interventions fit into international childhood obesity initiatives.

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S11.1

Reaching children where they live, eat, and play: The Our Choice/Nuestra Opción study

Authors:

Guadalupe Ayala, Kelsie Full, Leticia Ibarra, Amy Binggeli, Jamie Moody, Janette Angulo, Thomas McKenzie, John P. Elder

Purpose:

To describe the Our Choice/Nuestra Opción demonstration study, an intervention targeting the prevention and control of childhood obesity through changes to policies, systems, and environments. The study is occurring in Imperial County, California, USA, which has the highest rates of childhood obesity in California.

Methods:

This demonstration study is using evidence-based strategies to promote health behaviors associated with the prevention and control of obesity (fruit and vegetable consumption, drinking water, physical activity, and sleep) in five sectors: Families, a federally qualified health center, childcare centers, elementary schools, and the community, specifically restaurants and recreation centers. A 2x2 factorial study design will allow us to examine whether a combined health care (family and clinic) and a public health approach (childcare, schools, and community) is more effective at preventing and controlling childhood obesity compared with a health care only intervention, a public health only intervention, versus a control condition.

Results:

Intervention activities are currently underway in all sectors, including three clinics, 26 childcare centers, 13 elementary schools, 3 restaurants, and 2 recreation centers. Recruitment of 1,200 children between the ages of 2 and 11 years old and their families will allow us to examine impact on BMI z-score and obesigenic behaviors over an 18 month period. Additional process and impact evaluation activities are examining changes to policies, systems, and environments in all sectors.

Conclusions:

Our Choice/Nuestra Opcion intervention is developing an effective model to inform future obesity prevention research and practice efforts at the community level.

S11.2

Texas CORD: Embedding secondary prevention efforts into primary prevention for childhood obesity prevention and management

Authors:

Deanna Hoelscher, Nancy Butte, Sarah Barlow, Steven Kelder, Shreela Sharma, Elizabeth Vandewater, Stephen Pont, Terry Huang

Purpose:

To develop, implement and evaluate a systems-level approach for obesity prevention and management for low-income, ethnically diverse children aged 2-12 years and their families using secondary prevention programs embedded within community-level primary prevention efforts in Texas.

Methods:

Primary prevention intervention and matched comparison catchment areas were identified in Austin and Houston. The primary prevention 2-year intervention includes CATCH Early Childhood in Head Start programs, CATCH in elementary schools, Next Steps in primary care clinics, and community outreach. For the secondary prevention intervention, overweight/obese children (n=576), aged 2-12 years, and their families are recruited through primary care clinics in the intervention catchment areas; families are randomly assigned to a 12-month targeted program (intervention) or the primary prevention program (comparison). Program components include MEND, a structured weight maintenance program with CATCH exercise sessions, followed by monthly family sessions and transition of children into YMCA youth sports. Evaluation of the primary prevention will include changes in overweight/obesity prevalence, behavioral risk fac-

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tors, healthcare utilization, and program participation. Outcomes of the secondary intervention will include child body mass index (BMI z-score), related behaviors, and healthcare utilization at baseline, 3 and 12 months. Cost effectiveness of the interventions will be assessed.

Results:

Baseline descriptive data will be presented for intervention and comparison catchment areas. The systems linking the components of the primary and secondary interventions will be outlined.

Conclusions:

The integration of targeted programs for families with overweight/obese children within supportive community-level public health programs should provide a sustainable model for childhood obesity prevention.

S11.3

Massachusetts CORD: Leveraging existing state infrastructure - Mass in Motion Kids

Authors:

Kirsten Davison, Elsie Taveras, Steven Gortmaker, Jennifer Falbe, Rachel Blaine, Rebecca Franckle, Lauren Smith, Thomas Land

Purpose:

Mass in Motion Kids Childhood Obesity Research Demonstration Study (MA-CORD) is a comprehensive, multi-sector intervention to prevent and reduce childhood obesity among racial/ethnic minority, low-income children (ages 2-12 years). This presentation will outline the rationale behind MA-CORD, the evidence-based interventions implemented, and the multi-layered evaluation strategy.

Methods and Results:

MA-CORD is a two-year intervention which incorporates evidence-based interventions in primary health care, Women, Infants and Children (WIC), child care, schools and after-school programs, as well as community-wide programs to improve food, beverage, physical activity, and messaging environment in two cities in Massachusetts. MA-CORD builds on a statewide healthy lifestyle initiative (Mass in Motion) which incorporates state regulations requiring BMI measurement of school children, nutrition standards for competitive foods in schools, menu calorie posting requirements, worksite wellness initiatives, and wellness leadership grants which support the establishment of multi-sector coalitions to build local capacity. Its evaluation will use a combination of pre- post time series and quasi-experimental designs and draw on multiple existing data streams (school BMI records, electronic medical records) to examine the effect of MA-CORD on change in individual-level lifestyle behaviors, body mass index (BMI), satisfaction with health care services, and quality of life among children in the two intervention cities compared to a comparison city.

Conclusions:

MA-CORD will provide valuable information on the extent to which a multi-setting, multi-level intervention that combines clinical and public health strategies can improve dietary and physical activity behaviors and ultimately reduce obesity in low-income children.

S11.4

Childhood Obesity Research Demonstration (CORD): Evaluation plan

Authors:

Daniel O'Connor, Alok Bhargava, Rebecca Lee, Paras Mehta, Deborah Thompson, Tracey Ledoux, Teresia O'Connor, Policies Investigators BETTER

Purpose:

The Childhood Obesity Research Demonstration (CORD) project evaluation will determine the extent to which the CORD model of linking primary care (PC) interventions to public health (PH) interventions in multiple community sectors affects BMI and behavior in children (2 to 12 years).

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Methods:

The evaluation center will analyze the data from three independent multilevel, multi-sector projects designed to induce environmental, systems, and policy changes that are intended to impact childhood obesity. The comprehensive plan includes evaluation of program delivery (process), outcomes (impact), sustainability, and cost. The process evaluation will assess reach, dose delivered, dose received, and fidelity of all interventions. The impact evaluation will use mixed linear models to account for heterogeneity in populations and settings among project sites and include covariates reflecting environmental characteristics and intervention dose to estimate CORD model effects. The sustainability evaluation will assess potential for replicability, continuation of benefits after the funding period, and institutionalization of the intervention systems and activities, as well as aspects of community capacity that support program delivery. Finally, cost analyses will assess how much benefit can potentially be gained per dollar amount invested in programs designed using the CORD model.

Results:

The keys to combining and analyzing data from multiple projects are the CORD model framework used by all projects and the numerous common measures for the behavioral and health outcomes and important covariates.

Conclusions:

Evaluation results will be used to make evidence-based recommendations for implementing and sustaining programs based on the CORD model in broader populations and contexts.

S12

Findings from the Health Behavior in School-aged Children (HBSC) study

Moderator: Jens Bucksch, Bielefeld University, School of Public Health, Bielefeld, Germany

Presenters: Ellen Haug, Jens Bucksch, Colette Kelly, Mette Rasmussen

Discussant: Ronald Iannotti, University of Massachusetts, Boston, Massachusetts, USA

Purpose:

There is lack of international comparative data over time in energy-related behaviors and overweight in adolescents. The international Health Behavior in School-aged Children (HBSC) study is a WHO collaborative cross-national study. With its standardized methodological approach and representative samples for the 11, 13 and 15 year-olds within over 40 participating countries across Europe and North America HBSC is able to provide unique and important insights into secular trends in adolescent health and health behaviors over the last decade.

Rationale:

HBSC collected a range of self-reported energy-related behaviors as well as height and weight. The HBSC survey has taken place every four years since the early 1980s. Moderate-to-vigorous physical activity (MVPA), screen time, fruit and vegetable consumption as well as BMI were examined in 2002, 2006 and 2010 in a similar way in a minimum of 25 countries. This unique trend data covers different and essential aspects of energy related behaviors and are highly important to inform the scientific community, policy and public in the area of behavioral nutrition and physical activity.

Objectives:

- To describe recent international trends in MVPA and screen time as well as in fruit and vegetable consumption
- To describe recent international trends in overweight and obesity
- To improve visibility and use of international HBSC study findings
- To bring together and build on experiences of researchers from different countries working on the HBSC study

Summary:

The session will start with a short overview (10 minutes) of the HBSC Study. This will provide an introduction to the aims of the study, the standardized methodological approach and the compilation of the international trend data file. Four presentations (each 15 minutes including 2 minutes for questions from the audience) will show time trends in different energy-related behaviors and overweight. All presentations share a comparable trend data file that comprises

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three HBSC-waves from 2002 to 2010. The primary focus of the presentations is on identifying change in prevalence of energy-related behaviors as well as overweight and obesity over time. The first presentation is on trends in MVPA by gender and socio-economic status. The second and third ones are on screen time behaviors and fruit and vegetable consumption, respectively. The last presentation will focus on the energy related outcome of Body-Mass-Index in terms of trends in overweight and obesity. After the formal presentations a discussant will sum up important findings, indicate further implications and limitations of findings and facilitate an overall discussion (20 minutes) between the audience and all presenters.

S12.1

Secular trends in moderate-to-vigorous physical activity from 2002 to 2010: A cross-national perspective

Authors:

Ellen Haug, Michal Kalman, Joanna Inchley, Dagmar Sigmundova, Ronald Iannotti, Jorma Tynjälä, Zdenek Hamrik, Jens Bucksch

Purpose:

Current international guidelines state that adolescents should participate in at least 60 minutes of MVPA daily, to gain short- and long-term health benefits. The present study gives a broad cross-national perspective into the overall time patterns of adolescents' MVPA from 2002 to 2010 across 32 countries from Europe and North America (MVPA).

Methods:

The study presents self-reported questionnaire data from representative samples of 479,674 pupils aged 11-, 13-, and 15 years that participated in the Health Behavior in School-aged Children (HBSC) Study in 2001/02, 2005/06 and 2009/10.

Results:

There was a slight overall increase in the proportion of pupils reporting 60 minutes of MVPA daily between 2002 and 2010. A significant increase was observed in 16 countries among boys and 12 countries among girls. Conversely, nine countries showed a significant decrease among boys and eight countries among girls. Across all countries combined, children with higher SES were more likely to meet the PA recommendation than children with low SES. There was no significant year x SES interaction.

Conclusions:

Despite efforts to promote physical activity among youth we observed only a minor increase from 2002 to 2010 in the proportion of boys and girls aged 11-15 meeting the recommendations across Europe and North America. As the majority of adolescents do not meet current PA recommendations, further investments at national and international levels are therefore necessary to increase physical activity participation among young people and reduce the future health burden associated with inactivity.

S12.2

International temporal trends in screen time from 2002 to 2010 among adolescents - findings from the cross-national HBSC study

Authors:

Jens Bucksch, Dagmar Sigmundova, Michal Kalman, Zdenek Hamrik, Joanna Inchley

Purpose:

Two or more hours of daily screen time are associated with adverse health outcomes. The purpose of this study was to examine recent secular trends in TV viewing and PC use among adolescents across 29 countries.

Methods:

We used data from the last three survey waves 2002, 2006, 2010 of the Health Behavior in School-aged Children study. Overall, 471,313 children were included in the analyses (48.9% boys). Country- and sex-specific changes over time in

prevalence as well as a linear time trends for TV viewing and PC use controlling for age were evaluated by logistic regression. The cut-off point for each of the screen time variables was two hours or more per day.

Results:

There was a clear overall decrease in the odds of watching TV from 2002 to 2010 in boys (OR=0.63, [95-% CI 0.61-0.64]) and girls (OR=0.67 [0.65-0.68]). In nearly all countries we observed a significant linear decrease. In contrast, for PC use, there was a large overall significant increase in both genders ($p<.001$). At the country specific level we found a significant increase in 27 out of 28 countries among girls. In boys, 17 out of 28 countries showed a significant increase of PC use and 4 out of 28 a significant decrease.

Conclusions:

Despite the observed decrease in TV viewing in a broad cross-country perspective, there is a clear need for national and international strategies aimed at reducing overall screen time particularly in light of the marked increase in computer use among girls and boys.

S12.3

Fruit and vegetable consumption among adolescents from 2002 to 2010: Findings from the Health Behavior in School-aged Children study

Authors:

Colette Kelly, Trine Pagh Pedersen, Kristiina Ojala, Rikke Krølner, Anna Dzielska, Namanjeet Ahluwalia, Mariano Vincenzo Giacchi, Carine Vereecken

Purpose:

Fruit and vegetable consumption is linked to many positive health outcomes, both during adolescence and for long term health. Consequently many countries have implemented programmes and policies to increase intake of fruit and vegetables among children and young people. However data on cross-national trends in fruit and vegetable intake are lacking. This study aimed to fill this gap.

Methods:

Data of 488,951 adolescents, aged 11-, 13- and 15- years, from 33 mainly European and North American countries/regions participating in the cross-sectional Health Behavior in School-aged Children surveys in 2002, 2006 and 2010, were used to investigate trends in daily fruit and vegetable consumption between 2002 and 2010. Multilevel logistic regression analyses were conducted for each country and using pooled data.

Results:

There were large differences in daily fruit and vegetable consumption between countries. Moreover a large proportion of adolescents do not consume fruit and vegetables on a daily basis. Overall, an increase in daily fruit and vegetable consumption between 2002 and 2010 in the majority of countries for both genders and all three age groups was observed. A decrease in consumption was noticed in five countries for fruit and five countries for vegetables.

Conclusions:

While, overall, a positive trend is noticed, increases in daily fruit and vegetable consumption are still required.

S12.4

Cross-national trends in overweight prevalence from 2002 to 2010 in 11-15 year olds: Findings from the WHO-Collaborative Health Behavior in School-aged Children (HBSC) survey

Authors:

Mette Rasmussen, Namanjeet Ahluwalia, Paola Dalmasso, Leah Lipsky, Candace Currie, Ellen Haug, Colette Kelly, Mogens Trab Damsgaard

Purpose:

The purpose of this study was to assess recent secular changes in prevalence of overweight (including obesity) among 11-, 13-, and 15-year-olds in 33 countries.

Methods:

Data from the Health Behavior in School-Aged Children (HBSC) WHO collaborative cross-national study from three consecutive survey cycles (2002, 2006, and 2010) were used. Data from twenty-five countries with at least 80% response rate for self-reported height, weight and age were included for analysis. Age-standardized prevalence of overweight was estimated, separately by survey cycle and sex, using the International Obesity Task Force 2000 cut-offs. Time trends were assessed using logistic regression analysis. A multiplicative interaction term examined potential modification by age.

Results:

Overweight prevalence increased for boys in 13 countries and in 12 countries for girls. Stabilization in overweight rates was noted in the remaining countries; none of the countries exhibited a decrease over the 10-year period examined. Increasing overweight prevalence was predominantly seen in countries in Eastern Europe. Differential trends in overweight prevalence by age were noted in only 5 countries (Russia, Estonia, Poland, Portugal and the Netherlands).

Conclusions:

From 2002 to 2010 overweight prevalence generally stabilized in 11-15-year-olds; however increased prevalence levels were noted in many countries in Eastern Europe while no country showed a decline. Overweight prevalence remained high in several countries in Europe and North America. These findings suggest the need for further research to better understand the phenomena underlying the trends in overweight as well as continued efforts globally to prevent overweight in youth.

S13***Status of theory in health behavior change research***

Moderator: Claudio Nigg, University of Hawaii, Honolulu, HI, USA

Presenters: Susan Mitchie, Pedro Teixeira, Ryan Rhodes

Discussant: Claudio Nigg, University of Hawaii, Honolulu, HI, USA

Purpose:

This symposium will take an integrative approach in critically evaluating the status of theory in the health behavior change field.

Rationale:

Interventions based on theories increase our understanding of why behavior change occurs, guides practitioners in how to develop interventions, and have been found to be as or more effective as non-theory based interventions. A critical evaluation of theory application will provide directions of future inquiry, a more integrated understanding of behavior change, and in turn provide practitioners more guidance for effective intervention.

Objectives:

- 1) To identify issues and limitations of current health behavior change theories;
- 2) to discuss methods of evaluating theory use;
- 3) to understand future research areas in this field

Summary:

Dr. Michie will present definitions of behavior, theory and the key dimensions of usefulness of theory, using the Trans-theoretical Model (TTM) and Social Cognitive Theory (SCT) as examples. Dr. Teixeira will provide an update of recent findings from Self-Determination Theory (SDT)-based interventions targeting physical activity and diet, and he will apply Michie and Prestwich's (2010) Theory Coding Scheme to evaluate how adequately theory (i.e., SDT) has been used in those studies. Dr. Rhodes will follow this with a critical examination of the intention-behavior gap and which current models address this. Dr. Nigg will summarize and integrate the presentations within a framework for evaluating appropriateness of theory application - A litmus test (Nigg & Paxton, 2008) which consists of:

- 1) Is a theory identified?
- 2) Is the (entire) theory described?

- 3) Are all of the theory components translated into the intervention?
- 4) Are all of the intervention components implemented?
- 5) Are all of the theory components assessed?
- 6) Are the theory variables and the outcome congruent?
- 7) Did the mediators change during the intervention?
- 8) Did the outcome change?

S13.1

What does theory usefulness mean: A multidisciplinary consensus

Author:

Susan Michie

Purpose:

Theory is potentially useful for designing and evaluating interventions and for synthesizing evidence. There are many theories (82 in a recent review of behavior change theories; Davis et al, under review). It is not obvious why some are more popular than others, nor what the relationship is between popularity and usefulness.

Methods:

A multidisciplinary group of 30 psychologists, sociologists, anthropologists and economists engaged in a consensus exercise to agree definitions of behavior, theory and the key dimensions of usefulness of theory.

Results/Conclusions:

These will be reported, along with recommendations as to how to operationalize and evaluate these. Data on the application, and its limitations, of two of the currently most popular theories will be presented.

S13.2

Testing the usefulness of self-determination theory for changing physical activity and nutrition behaviors

Author:

Pedro Teixeira

Purpose:

Self-determination theory (SDT) has emerged as a popular theoretical framework to explain the motivational dynamics behind the self-regulation of health behaviors. SDT is promoted as a highly applicable and practically useful framework for designing behavior change interventions, especially those aiming at long-term adherence. Although cross-sectional evidence prevails, evidence for the efficacy of SDT-informed interventions targeting health behaviors, including physical activity and eating behaviors, is accumulating rapidly.

Methods:

This talk will provide a summary of these research findings to date and assess how adequately SDT has been applied.

Results/Conclusions:

In line with the Theory Coding Scheme proposed by Michie and Prestwich (2010), we will evaluate whether relevant theoretical constructs are targeted, how well they are measured, which behavior change strategies are used (to impact those constructs), and whether study design allows for theory itself to be tested and refined.

S13.3

Models of intention-behavior discordance and a review of the action control framework

Author:

Ryan Rhodes

Purpose:

The intention-behavior gap is a topic of considerable contemporary research in physical activity and eating behavior, given that many theories position intention as the proximal antecedent of behavioral enactment. The study objective was to overview the models that attempt to understand intention-behavior discordance either via mediation or moderation variables and review these predictor variables using the action control framework that divides intention (high/low) and subsequent behavior (high, low) into a two by two dependent variable.

Methods:

Literature searches concluded in July 2013 among five key search engines. This yielded 2865 potentially relevant records; of these, 13 studies passed the full eligibility criteria (12 physical activity, 1 eating behavior).

Results:

Overall, several contemporary models in physical activity and eating do position variables as explanations for intention-behavior discordance including but not limited to health action process approach, implementation intention theory, integrated change model and specific divisions of the transtheoretical model. When applied to the action control framework, predictors of intention-behavior discordance was from an amalgam of motivational (affective attitude, perceived behavioral control), self-regulatory (behavioral processes, planning), personality (extraversion) and habituation (automaticity, identity) constructs.

Conclusions:

Several next generation models are available to researchers - often among participants with high starting intentions - and some diversity in the variables positioned as critical in the intention-behavior gap. Empirical results from the action control approach provide preliminary evidence that several types of concepts, from additional motivation over and above what it took to form an intention to behavioral strategies to tie intention to behavior, may be important.

S14

There's an app for that

Moderator: Anouk Middelweerd, VU Medical Center Amsterdam, Amsterdam, The Netherlands

Presenters: Margaret Allman-Farinelli, Artur Direito, Anouk Middelweerd, Janna Stephens

Discussant: Johannes Brug, VU Medical Center Amsterdam, Amsterdam, The Netherlands

Purpose:

The purpose of this symposium is to present and discuss experiences and findings from recent innovative studies using smartphone applications (apps) to promote healthy eating and physical activity (PA).

Rationale:

The use of mobile internet and smartphones is growing rapidly. Besides the basic features smartphones support third party applications, sensing, internet access and wireless connectivity. Because of the potential of apps to be personalized and to offer tailored support, linking importantly to insights from goal setting, feedback, and social influence theory, they are a promising and popular tool in promoting healthy eating and PA, but little is known about the usability and effectiveness of such apps.

Objectives:

1. To present examples of how to use apps to promote healthy behavior.
2. To get an overview of the state of the art about the usage of apps in health promotion interventions and the effectiveness of those apps.
3. To generate a discussion of the possibilities of apps in health promotion.

4. To generate a discussion of how to handle the limitation of apps in health promotion.

Summary:

During the symposium the findings of studies conducted in Australia, New Zealand, the Netherlands and the USA will be presented. The speakers will present their findings of using apps in interventions focusing on healthy eating and PA. The first speaker will present the results of a qualitative study among Dutch students exploring the usability and preferences of health promoting apps, in particular apps promoting PA. The next speaker will share their experience about developing a smart coach to promote PA, diet change, and cardiovascular health. The third speaker will focus on the effectiveness of two apps targeting PA. The last speaker will present the results of a study using an app to promote healthy eating. Finally the discussant will lead the discussion on how these findings should be interpreted and translated in future intervention strategies or wider implementations.

S14.1

Preferences of Dutch students for physical activity apps- A qualitative approach

Authors:

Anouk Middelweerd, Maartje van Stralen, Danielle van der Laan, Julienka Mollee, Mirjam Stuij, Saskia te Velde, Johannes Brug

Purpose:

The purpose of this qualitative study was to explore the preferences for a physical activity smartphone application (PA-app) in Dutch students.

Methods:

Thirty Dutch students (aged 18-25) used a PA-app for three weeks and subsequently attended a focus group discussion (k=5). This addressed general app usage, usage and appreciation of a PA-app, appreciation and preferences of different features and sharing of accomplishments on social media. The discussions were audio and video taped, transcribed and analyzed according to the conventional content analysis based on grounded theory.

Results:

Participants preferred PA-apps that coach and motivate them and provide tailored feedback towards personally set goals. Students appreciated PA-apps that enable competition with friends by ranking or earning rewards, if the reward system is transparent. They liked tracking their workout using GPS. An additional website should offer detailed information about their accomplishments and progress. The students preferred a simple and structured layout without unnecessary features. Ideally, the PA-app should enable personal tailoring to their wishes by removing features. Students will only share exceptional performance as registered by apps on social media.

Conclusions:

Participants prefer PA-apps that coach and motivate them and provide tailored feedback towards personally set goals, with possibilities for competition with friends and GPS to track their behavior. This target group's ideal app thus makes use of behavior change techniques (e.g. goal setting, rewards, monitoring and tailored feedback) proven to be effective.

S14.3

Smartphone applications for enabling healthy eating: Fruit and vegetables a case study

Authors:

Margaret Allman-Farinelli, Lana Hebden, Amelia Cook, Kate Balestracci

Purpose:

Most 'apps' for weight loss are calorie counters with no focus on diet quality or incorporation of behavioral theories. The Global Burden of Disease 2010 report highlighted inadequate fruit and vegetable consumption as major risk fac-

tors. Younger adults eat least fruit and vegetables. As part of a Smartphone program to prevent weight gain, we created an 'app' to help young adults eat more fruit and vegetables.

Methods:

The 'app' allowed self-monitoring of daily fruit and vegetable intake; gave feedback against targets (2 fruit, 5 vegetables); and provided tips and recipes to facilitate goal achievement with the Transtheoretical model underpinning development. The 'app' was tested in a randomized controlled trial in 18 to 35 year olds with use restricted to intervention group. Intake was assessed at baseline and 12 weeks using validated short questions and food frequency questionnaire.

Results:

To date 88 participants have completed the program with 44 having access to the app. At entry more than half the participants consumed <2 servings of fruit daily. For vegetables, only two participants (one in each group) achieved the target. At three months the likelihood of increasing intakes in the intervention was OR 1.7 (95% CI 0.4 -7.7) for fruit and 3.1 (95% CI 1.0 to 9.7) for vegetables.

Conclusions:

As the study is ongoing, conclusions regarding success of the 'app' are premature. However, an app that addresses targeted dietary behaviors and developed using formative research, literature review and underpinned by behavioral theory has the potential for wide reach and efficacy.

S14.4**The effectiveness of two smartphone applications for IMproving FITness - AIMFIT****Authors:**

Artur Direito, Avinesh Pillai, Robyn Whittaker, Ralph Maddison

Purpose:

Physical activity (PA) is important for the health and wellbeing of young people. However, teenagers live in an environment where multiple options for sedentary leisure activities and barriers to PA coexist. Many interventions to increase PA have had limited success. Therefore, public health researchers have begun to examine novel approaches to deliver behavior change interventions, such as mobile phones. Despite the recent proliferation of smartphone applications for health-related behavior change, there is a dearth of effectiveness data. This study aimed to determine the effectiveness, acceptability and usability of two popular smartphone applications for increasing physical fitness in young people.

Methods:

A three arm parallel randomised controlled trial is proposed with 51 teenagers (14-17 years) who own a smartphone/iPod touch. The applications comprise an eight-week program for novices to train and run 5km but vary in their features. Each participant will be randomised to 1) an immersive application, consisting of a training program combined with an immersing story delivered via headphones (n = 17), 2) a non-immersive application, consisting of the training program only delivered via headphones (n = 17), or 3) usual care, where participants will be asked to continue with their usual physical activities (n = 17).

Results:

The primary endpoint is change in cardiorespiratory fitness assessed with the 1mile run/walk test. Secondary endpoints are PA levels, self-efficacy, enjoyment, psychological need satisfaction and acceptability and usability of the apps. Intention to treat analysis will be performed.

Conclusions:

Findings will inform on the potential of apps to influence PA.

S15

Beyond school meal programs - foodscape approach to school based behavioral nutrition

Moderator: Bent Egberg Mikkelsen, Aalborg University, Copenhagen, Denmark

Presenters: Dorte Ruge, Barbara Guidalli, Fr  derike Mensink

Discussant: Bent Egberg Mikkelsen, Aalborg University, Copenhagen, Denmark

Purpose:

The purpose of this symposium is to discuss why and how increasing rates of obesity among young people and associated focus on the adverse effects of unhealthy eating have fuelled a new interest in schools as arena for prevention. With the increased consensus among policy makers there is a need to develop effective local level strategies. The research question is: How can innovative and holistic approaches to food and nutrition at school be reinforced as an important, local level strategy for better behavioral nutrition? In recent years, school based strategies have expanded beyond the traditional focus on availability, accessibility, and adequacy of nutritious meals in schools and now include various accompanying measures. Such accompanying measures are activities that expand out of the canteen, link to the classroom and include learning and teaching involving elements such as hands-on-cooking and farm-to-school links.

Rationale:

The organizers of this symposium find it important to challenge the assumption, that one-level interventions at school adequately can solve problems with obesity and overweight among children. In opposition to this, multi-level interventions in schools as 'settings' or school foodscapes are more likely to promote health. The common unifying theme for this symposium ties these interventions to a holistic approach of how to understand the determinants that shape behavioral nutrition among children.

Objectives:

The aim of the symposium is to present and discuss examples of how different, innovative conceptual foundations are being integrated in school foodscapes and the implications of this for improved behavioral nutrition in schools. The interdisciplinary theoretical framework include foodscape studies (Mikkelsen 2011), "whole school approach" (Morgan and Sonnino 2008), communities of practice (CoP) (Wenger 1998) and theories about 'Health Promoting Schools' (Simovska and Jensen 2009).

Summary:

This symposium presents evidence from recent foodscape studies from Spain, US, Denmark and the Netherlands, taking a broader approach to healthy eating from different countries, focusing on school-oriented policies and their impact.

S15.1

Addressing health promotion through an integrated 'whole school' approach to eating in secondary school - results from the LOMA-Nymarkskolen case study

Authors:

Authors: Dorte Ruge, Morten Kromann Nielsen, Bent Egberg Mikkelsen

Purpose:

The aim of this paper is to present results from the case study of the LOMA-Nymarkskolen intervention. The case study applies a multi-disciplinary theoretical framework represented by the WHO health promotion platform (Jensen and Simovska 2009) and foodscape studies (Mikkelsen 2011).

Methods:

Research has been conducted as a descriptive, single-case study at Nymarkskolen in the Municipality of Svendborg. Data was collected through qualitative methods in the form of e.g. observations, interviews, video and questionnaires (Ruge and Mikkelsen 2013). These data have been triangulated with quantitative data from a quasi-experimental study from November 2013.

Results:

From the LOMA-Nymarkskolen case study are expected to show that an integrated strategy, where accompanying measures are combined with curriculum activities, educational links with local suppliers, communities of practice (Wenger 2000) and innovative food sourcing strategies, has a positive impact on the determinants of healthy behavior among students, measured by their knowledge, skills, action competence and 'quality of life' (Lamine et al. 2012).

Conclusions:

Students' action competence seem to be increased during this kind of health educational intervention and students' genuine participation is regarded the prerequisite for this. In order to achieve similar results in other secondary school foodscapes we therefore recommend, that teachers are regarded as key-persons and consequently supported by education and adequate conditions for the health educational potential of the LOMA programme to be fully utilized. In closing, this integrated approach challenges the assumption that healthy eating in schools can be achieved by one-level instrumental interventions.

S15.2**A conceptual framework for understanding children foodscapes in & out of school****Authors:**

Barbara Guidalli, Tony Torralba

Purpose:

The aim of this paper is to offer a conceptual framework for understanding how children learn to eat in and out of school and thus address the theoretical and methodological needs of this recent call for accompanying measures. School food reform efforts have traditionally focused on how to meet the nutritional and caloric needs of children through balanced meals (Poppendieck, 2010). Recent research indicates however, that it may be necessary to focus on accompanying measures that seek, through teaching and learning interventions, to modify the eating behavior of school children (EU SWD-2012 435 final, p7). However, there is little or no research on how teaching, learning and development occur within the context of eating in school settings (or beyond).

Methods:

We employ the concept of "foodscapes" (Johansson et al. 2009, Mikkelsen, 2011) to theoretically capture the complexity of eating practices among children in and out of school, and to methodologically contextualize our examination of such practices. Ethnographic and observational approaches were employed to gather records of eating activity and related phenomenon across school lunchrooms, school kitchens, homes, candy stores, and family restaurants.

Results:

Initial results reveal that children may be developing eating practices-in-context, meaning they selectively assess, adjust and develop eating practices according to the particular elements or/and factors existing within the foodscapes they participate in.

Conclusions:

Initial results may challenge assumptions that teaching children how to eat in school will become an inherent quality of the individual and will 'transfer' to other settings or foodscapes (Mikkelsen & Ohri-Vachaspati, 2013).

S15.3**To what extent are Dutch schools for secondary and vocational education implementing both the National guidelines for school canteens and the tailored advice as provided by the Netherlands nutrition centre ?****Authors:**

Frédérique Mensink, Margret Ploum

Purpose:

Most schools for secondary and vocational education would support healthy food for their pupils, if it were not for the school environment where sweets and snacks are easily available. The Netherlands Nutrition Centre applies an integrat-

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ed whole school approach with tailored advice for implementation at school locations provided by their 'Schoolcanteen Brigade' after a school visit, which incorporates not only the nutritional guide lines, but a whole school and school environment perspective with practical tips for all these aspects. The aim of this paper is to offer data on the health status of the food on offer in Dutch school canteens according to national guidelines for school canteens. We want to examine whether there is a difference in health status in school canteens, which are or are not visited by the brigade. Furthermore we want to measure the intention to implement the brigade's advice.

Methods:

500 School canteen scans have been conducted to measure the progression of implementation of the national guidelines for school canteens. A survey has been conducted among schools after the brigade has visited and advised the school.

Results:

Initial results indicate that schools visited by the brigade have the intention to implement school canteen guidelines and feel more confident to take first steps to address the whole school aspects of the approach.

Conclusions:

One-time only tailored advice may not be sufficient for sustainable implementation of school canteen guidelines as a component of a whole school approach, but must be prolonged for several years.

S16

Direct observational methods in childhood obesity research

Moderator: Jerica Berge, University of Minnesota, Minneapolis, MN, USA

Presenters: Jerica Berge, Kyung Rhee, Jayne Fulkerson, Julie Lumeng, Ester Sleddens

Discussant: Ester Sleddens, Maastricht University, Maastricht, The Netherlands

Purpose:

Four presenters (United States) and a discussant (International) will describe direct observational research methods (i.e., video-recorded data) used in childhood/adolescent obesity research. This innovative approach allows for a more in-depth examination of the risk and protective factors for childhood/adolescent obesity in the home environment (i.e., family meals, parent feeding behaviors).

Rationale:

Survey-based research has identified the importance of the home environment and parent feeding practices as important predictors of child obesity risk. However, survey results have raised more complex questions around the feeding environment (e.g., are hostile interpersonal interactions between family members at family meals associated with childhood obesity risk) that are difficult to answer using traditional reporting methods. Thus, a more in-depth understanding of the home environment is needed through direct observational methods.

Objectives:

- Direct observational methods used in research on child/adolescent obesity will be introduced.
- Similarities and differences between direct observational approaches used that span age, developmental stage, race/ethnicity, and coding systems will be presented.
- Results from studies using direct observational methods to address complex processes in home environments will be presented.
- Lessons learned from using direct observational approaches will be presented.

Summary:

In this symposium, innovative methodology, data collection, analytical techniques, and lessons learned from direct observational research on child/adolescent obesity will be presented. These presentations have been carefully selected to represent research across diverse populations (e.g., minorities and low income populations), children from different developmental stages (i.e., preschoolers 0-5yrs; school age children 6-12yrs; and adolescents 13-18yrs), different components of the family home environment (e.g., parent feeding practices, parenting style, interpersonal interactions at

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family meals), different locations for data collection (i.e., the home environment or standardized lab-based protocol), and differing coding systems to quantify the data (e.g., global coding systems, specific behavioral frequency coding). The discussant, who also has experience with direct observation methods, will highlight similarities and differences across the four research projects to identify the continuum of direct observational methodologies being used to study complex processes in the home environment.

S16.1

Observational ratings of feeding practices, preschooler's responses and the environments of meals at home

Author:

Jayne Fulkerson

Purpose:

To assess meal environments and parental feeding practices at mealtimes of 2-4 year-old children to identify modifiable behavioral determinants of obesity.

Methods:

Parents (n=40) of preschoolers completed a demographic/psychosocial questionnaire and video-recorded two home meals. Research staff directly measured parent/child anthropometric data. Existing standardized coding protocols were adapted to include children's direct responses to each parental feeding practice and inter-rater reliability was established.

Results:

Preliminary analyses of 77 video-recorded meals indicated the following parental feeding practices occurred most frequently: Indirect requests (e.g., see if you can eat some more peas; 88%), followed by direct requests (e.g., eat your peas; 70%), praising for eating (48%), direct spoon feeding (34%), and using food (usually dessert) as a reward (32%). The mean number of occurrences per meal was 3.5 for indirect request, 2.3 for direct request, 1.3 for direct spoon feeding, and less than 1 for praising for eating and using food as a reward. Children responded by eating most frequently to parental indirect (71%) and direct requests (58%). Parent-child conflict was observed in two-thirds of meals, and medium/high ratings of mealtime chaos were observed in one-quarter of meals. Yet, family cohesion was moderate/high for 90% of meals. Associations between controlling parent feeding practices and higher child weight status, female gender and younger age were also found.

Conclusions:

Parents use many feeding strategies with preschoolers but direct and indirect verbal requests were most common. Mealtimes may be chaotic with instances of conflict, but also appear to be a time for family cohesion.

S16.2

Feeding interactions among low-income, high risk children ages 4-8 years

Author:

Julie Lumeng

Purpose:

The goal of the study is to identify, among low-income 4- to 8-year-old children, maternal feeding styles, how they change over a period of 2 years, and whether these feeding styles precede or follow changes in child body mass index. The study is innovative in that it is the first to use a multi-method approach to define maternal feeding styles longitudinally in a low-income, high risk sample.

Methods:

301 low-income mother-child dyads (60% white, 40% of children overweight or obese) from Head Start are participants in this longitudinal study. Mothers participated in a 45 minute semi-structured audiotaped interview and completed questionnaires regarding feeding practices. Mothers videotaped three "typical mealtimes" at home while the index child was eating. Dyads also participated in a laboratory-based structured video-recorded feeding interaction. Video

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data were analyzed using observational coding systems to assess feeding context, child eating behavior and parent-child interaction.

Results:

Across 3 home meal observations, 82% of children always ate at a table, 28% of children always ate with the television audible, and 60% of children always ate with their mothers. During structured feeding interactions, mothers gave 4.5 (SD 4.5) prompts to eat familiar foods; 6.9 (7.5) prompts to eat unfamiliar foods; 2.0 (SD 3.2) discouragements to eat familiar foods and 1.2 (SD 2.3) discouragements to eat unfamiliar foods. Cross-sectional analyses showed significant associations between more controlling parent feeding practices and higher child BMI percentile.

Conclusions:

Future analyses will examine longitudinal associations between directly observed maternal feeding style and future child obesity risk.

S16.3

Role of parenting style and family functioning in pediatric weight loss

Author:

Kyung Rhee

Purpose:

Family meals have been positively related to decreased obesity risk among children. However, little is known about which aspects of the meal provide this protective effect. Using an innovative direct observational method, our goal was to identify differences in parenting among families with normal weight and overweight/obese children, as well as determine which factors predict weight loss.

Methods:

45 normal weight and 48 overweight parent-child dyads (8-12 years old) participated. Families were videotaped eating dinner in their home at baseline. Overweight families participating in a 16-week weight loss program (n=44) were also videotaped eating dinner after the intervention. Using our newly developed global coding system, meals were examined for parenting dimensions, eating behaviors, and family functioning. Non-parametric tests were used for analysis.

Results:

Parents of normal weight children were more likely to display firm discipline during the meal ($p=0.02$) than parents of overweight children. They also had higher displays of affection ($p=0.01$) and engagement ($p=0.05$) with each other. Among overweight children, parents who displayed greater warmth and affection had greater changes in child BMI percentile ($r = -0.34$, $p<0.05$). Parents and children with a slower pace of eating had greater decreases in child BMI percentile ($r = -0.47$ and -0.41 respectively, $p<0.05$).

Conclusions:

Results suggest that parents of normal weight children are using more authoritative parenting behaviors during meal-times. These behaviors also predicted greater change in child BMI percentile. Efforts to increase parent displays of warmth and affection may help to increase the likelihood of weight loss success.

S16.4

Risk and protective factors of adolescent obesity in the family home environment: A direct observational approach

Author:

Jerica Berge

Purpose:

Research has consistently shown that family meals play an important role in promoting healthful dietary intake in adolescents. Less is known about the key protective factors related to family meals. Investigating characteristics of family meals, such as the emotional atmosphere during the meal (e.g., communication, affect regulation) and parenting prac-

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tices (e.g., authoritative parenting style), will help identify these influential factors.

Methods:

A sub-sample of participants (n = 41) from Project EAT-III, a population-based cohort study with adolescents from racially/ethnically and socioeconomically diverse backgrounds participated in this direct observational study. Two family meals were video-taped in each family's home and were objectively coded using the Mealtime Interaction Coding System. Linear regression models, adjusted for sociodemographics, were fit for each of the continuous outcomes (frequency of family meals, fruit and vegetable intake, BMI).

Results:

Families who had a positive emotional atmosphere and supportive parenting (e.g., authoritative parenting style) during family meals had more frequent family meals, youth with lower BMI and higher intake of fruits and vegetables, and adults with higher fruit and vegetable intake. These results were significant after adjusting for race, socio-economic status, age and gender.

Conclusions:

Findings suggest that having a positive emotional atmosphere and supportive parenting during family meals (e.g. more communication, appropriate limit setting) was associated with adolescent and adult healthful dietary intake and lower adolescent overweight/obesity. Obesity prevention researchers should consider the importance of intervening with families around the emotional atmosphere at family meals as a way of increasing the frequency of family meals.

S17

Socio-environmental correlates of older adults' PA

Moderator: Veerle Van Holle, Ghent University, Ghent, Belgium

Presenters: Veerle Van Holle, Hannah Badland, Benedicte Deforche, Rodrigo Reis

Purpose:

To provide an overview of studies investigating correlates of physical activity (PA) in older adults, adopting an ecological approach. Studies were conducted across diverse geographic areas, so that cross-regional differences can be identified.

Rationale:

According to ecological models, the physical environment is an important correlate of specific PA behavior and may interact with individual factors. Such relationships have been investigated in several age groups (e.g., adolescents, adults), but current knowledge on these associations in older adults has remained scarce and inconsistent. Given that relationships may vary between countries, also in older adults, comparing studies across different regions is important.

Objectives:

This symposium aims to:

- (1) Present studies that have addressed associations between socio-ecological correlates of PA in older adults and compare results between different geographic areas
- (2) Provide an overview of different measurement methods to examine such correlates
- (3) Provide a forum to discuss differences in results between different countries
- (4) Discuss implications for further research and practice based on the findings

Summary:

The presentation sequence will be: 1) Associations between psychosocial factors and physical activity in Belgian older adults and the moderating effect of neighborhood walkability (Van Holle V, Belgium). This study investigated associations between psychosocial factors and walking for different purposes, and moderating effects of the physical environment. 2) How do perceived individual, social, and physical environments contribute to recreational- and transport-related walking? (Badland H, Australia). This study investigated separate, as well as simultaneous contributions of individual, social and physical environmental features on walking in older Australians. 3) A mixed-methods study using photographs to investigate the effects of environmental manipulations on a street's invitingness to walk for transport-

tation among older adults (Deforche B, Belgium). Using an innovative methodology, this study investigated the causal effects of manipulating environmental factors depicted in a photographed street on the street's invitingness for transportation walking among older adults. 4) Association of built environment characteristics and walking behavior among the elderly population in Bogotá, Colombia (Sarmiento O, Colombia). This study examined the association between the physical environment and older adults' walking in a developing country and assessed associations between different environmental attributes.

S17.1

How do perceived individual, social, and physical environments contribute to recreational- and transport-related walking?

Authors:

Hannah Badland, Karen Lamb, Gavin Turell, Nicola Burton, Billie Giles-Corti

Purpose:

Following an ecological line of query, it is recognised that there are multiple levels of influence on health behaviors; ranging from individual, social, and built environment influences. However, the separate and simultaneous contributions of these three levels have not been examined within different physical activity contexts. This research seeks to identify the independent and combined contribution of individual, social, and physical environments to recreational- and transport-related walking.

Methods:

Data were taken from 4,500 adults aged 42-67 years. Participants were drawn from the 2009 survey data (wave II) of the HABITAT (How Areas in Brisbane Influence Health and Activity). HABITAT is a longitudinal study of 'baby boomer' women and men living in Brisbane, Australia. Participants completed a survey examining: Psychosocial factors, social support, and walking for recreation and transport behaviors. Built environment variables were generated objectively using GIS. Separate indices were generated for each level of influence. Generalised estimating equations are being used to examine the separate and simultaneous contributions of the individual, social, and built environments with walking behaviors.

Results:

Preliminary findings demonstrate the importance of simultaneously targeting people and places when developing walking interventions, with the joint influence likely being greater than the individual components.

Conclusions:

Understanding how these levels of influence are associated with diverse physical activity outcomes (e.g., recreation, transport) will provide much needed guidance for planning and policy to develop interventions that maintain and support increased levels of physical activity engagement.

S17.2

Associations between psychosocial factors and physical activity in Belgian older adults and the moderating effect of neighborhood walkability

Authors:

Veerle Van Holle, Delfien Van Dyck, Benedicte Deforche, Jelle Van Cauwenberg, Ilse De Bourdeaudhuij

Purpose:

Adequate knowledge on socio-ecological correlates of physical activity in older adults is needed to develop effective health promotion programs. Recent research in this age group has focused either on individual or environmental factors separately, but studies examining interactions between these potential correlates are lacking. The present study investigated associations between psychosocial factors and older adults' moderate-to-vigorous physical activity (MVPA), walking for recreation and transportation. Furthermore, we examined whether objective neighborhood walkability moderated these associations.

Methods:

In total, 438 older adults (≥ 65 y), living across 20 neighborhoods in Ghent, Belgium, were included for analysis. Neighborhoods were stratified on GIS-based walkability (high vs. low). Participants provided self-report data on psychosocial factors (social support, self-efficacy, modeling, perceived benefits and barriers), transport-related walking, and recreational walking. Furthermore, objective MVPA levels were assessed through accelerometers, which were worn for at least 5 consecutive days.

Results:

Perceived benefits, barriers, social support and self-efficacy were related to older adults' objective MVPA and self-reported recreational walking, but none of these factors were associated with transport-related walking. Regarding moderating effects of walkability, more perceived benefits of PA were positively related to recreational walking, but only for residents of high-walkable neighborhoods. Furthermore, the inverse relationship between perceived barriers and recreational walking was more pronounced for residents of high-walkable neighborhoods.

Conclusions:

In Belgian older adults, psychosocial factors seem to be most important in explaining PA for recreational purposes. Given that few moderating effects were observed for walkability, psychosocial factors seem to be equally important for residents of different neighborhood types.

S17.3

A mixed-methods study using photographs to investigate the effects of environmental manipulations on a street's invitingness to walk for transportation among older adults

Authors:

Benedicte Deforche, Jelle Van Cauwenberg, Veerle Van Holle, Ilse De Bourdeaudhuij, Peter Clarys, Jack Nasar, Jo Salmon, Liesbet Goubert

Purpose:

To investigate the causal effects of manipulating environmental factors depicted in a photographed street on the street's invitingness to walk for transportation among older adults. Secondly, we aimed to study whether these effects were moderated by gender, functional limitations and current walking for transportation behavior. Thirdly, we investigated the moderating effects of environmental factors on the effect of another environmental factor.

Methods:

A set of 16 panoramic photographs, which depicted the same street in which 4 environmental factors (sidewalk evenness, traffic level, general upkeep, and vegetation) were manipulated, was created. Sixty older adults rated these photographs on their invitingness to walk for transportation on a 7-point scale. Qualitative data on the reasons for the assigned ratings were also collected.

Results:

All four environmental factors were significantly related to the assigned invitingness-scores. Quantitative and qualitative data showed sidewalk evenness to be the most important factor related to invitingness. The positive effect of good general upkeep on invitingness was stronger when the sidewalk was even. The presence of vegetation was related to higher invitingness-scores in participants without functional limitations but not in those with functional limitations.

Conclusions:

Sidewalk evenness appeared to be a key factor in order to promote walking for transportation among older adults. Few moderating effects were observed, suggesting that environmental modifications might be equally effective in different environmental contexts and population subgroups. Our innovative approach carries the potential to further our understandings of environment-PA relationships, but the findings should be confirmed by research in real-life settings.

S17.4

Association of built environment characteristics and walking behavior among the elderly population in Bogotá, Colombia

Authors:

Rodrigo Reis, Olga Sarmiento, Diana Perez, Luis Gomez

Purpose:

There is increasing evidence that the built environment has an influence on physical activity; however, little is known about this relationship in developing countries among older adults. To assess the associations between attributes of the built environment and walking patterns among the elderly.

Methods:

A multilevel cross-sectional study was conducted in 2007. Fifty neighborhoods were selected and 1966 participants aged ≥60 years were surveyed. Objective built environment measures were obtained in a buffer of 500m using GIS. Environmental perceptions were assessed via questionnaire.

Results:

People who lived in areas with middle park area (4.53%-7.98% of land) were more likely to walk for at least 60 minutes during a usual week (prevalence OR [POR] 1.42, 95% CI 1.02, 1.98). Those who lived in areas with the highest connectivity index (1.81-1.99) were less likely to report walking for at least 60 minutes (POR 0.64, 95% CI 0.44, 0.93). Participants who reported feeling safe or very safe from traffic were more likely to report walking for at least 60 minutes (POR 1.50, 95% CI 1.11, 2.03). The presence of Ciclovía (recreational program) was marginally associated with having walked at least 150 minutes in a usual week (POR 1.29, 95% CI 0.97, 1.73).

Conclusions:

This study showed that certain built and perceived environment characteristics were associated with walking among older adults living in Bogotá.

S18

Measurement issues in children's sedentary time

Moderator: Mai Chin A Paw, VU University Medical Center, Amsterdam, The Netherlands

Presenters: Nicky Ridgers, Mai Chin A Paw, Teatske Altenburg, John Reilly

Discussant: Dylan Cliff, University of Wollongong, Wollongong, Australia

Purpose:

This symposium addresses the application of breaks and bouts in sedentary time and the implications for data analysis and interpretation.

Rationale:

Wearable monitors (ActivPal and Actigraph) are increasingly being used to objectively assess sedentary time in children and adolescents. Recently the importance of how sedentary time is accumulated (sedentary patterns) has been shown regarding the health effects of sitting. However, few studies have examined the optimal definition and data reduction decisions for assessing sedentary patterns. No consensus exists on the definitions of breaks and bouts as well as the data reduction decisions regarding the calculation of breaks and bouts. Moreover, evidence regarding the applicability of the current definition of sedentary behavior in children is lacking.

Objectives:

Our symposium aims to present the state-of-the-art evidence-base for validity, definitions and analysis of sedentary patterns in children. Specific objectives are:

- Optimal accelerometer data reduction decisions regarding sedentary patterns
- Optimal definitions of sedentary bouts and breaks in sedentary time
- Energy expenditure of sedentary behaviors

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Summary:

Introduction by professor Mai Chin A Paw including the rationale and relevance of consensus regarding definitions and data reduction of sedentary patterns in children.

Presentation 1: Data reduction decisions regarding non-wear time when assessing children's sedentary time by Dr Nicky Ridgers

Presentation 2: Optimal data reduction decisions for sedentary patterns in children by prof Mai Chin A Paw

Presentation 3: Health effects of different definitions of bouts and breaks in sedentary time in children by Dr Teatske Altenburg

Presentation 4: Does the energy expenditure element of the current definition of sedentary 'works' for 4-6 y olds? by prof John Reilly

S18.1

Energy expenditure of sedentary behavior in children: Does the SBRN definition of sedentary behavior 'work' ?

Authors:

John Reilly, Tony Okely, Dylan Cliff, Xanne Janssen

Purpose:

This study aimed to: Describe the energy expended in common sedentary behaviors in young children (4-6 year olds); put this evidence in the context of reviews of published evidence on the energy cost of sedentary behaviors; test the extent to which energy expended during common sedentary behaviors in children is consistent with standard MET-based and SBRN definitions of sedentary.

Methods:

Whole-room calorimetry study of 40 children (mean age 5 years) with energy expenditure measured in three conditions in all 40: TV viewing; sitting at a desk; floor-based play.

Results:

Average energy expenditure during all three sedentary behaviors was consistent with the SBRN definition of sedentary. Energy costs expressed as a multiple of basal metabolic rate were: 1.15 (TV viewing); 1.39 (sitting at a desk); 1.36 (floor-based play). The energy cost of TV viewing was significantly lower than for the other two conditions. For a number of children, across all three conditions, energy expended as a multiple of basal metabolic rate exceeded the SBRN definition of 'sedentary'.

Conclusions:

The relative energy cost of sedentary behavior may be higher in young children than in adults, but the study is broadly supportive of the SBRN definition of sedentary behavior.

S18.2

Uninterrupted sitting and its effects on health indicators in children - breaks and bouts what are we talking about?

Authors:

Teatske Altenburg, Mark de Niet, Ilse de Bourdeaudhuij, Denes Molnar, Bettina Bringolf-Isler, Yannis Manios, Johannes Brug, Mai Chin A Paw

Purpose:

Recently the importance of the pattern in which sedentary time is accumulated rather than total sedentary time has been established. To date, there is no consensus on the optimal definition of sedentary bouts and breaks in children. To build evidence for such definitions, we examined the association of various sedentary bout definitions with indicators of weight status and cardiometabolic health.

Methods:

Accelerometer data of 647 European 10-12 year old children were collected in eight European countries as part of

the ENERGY cross-sectional survey. We analysed sedentary time in bouts of different durations, i.e. ≥ 5 , 10, 20 and 30 minutes < 100 cpm, tolerating zero, 30 and 60 sec ≥ 100 cpm within sedentary bouts. Indicators of weight status included weight, waist circumference and BMI. A cardiometabolic risk score was calculated on waist circumference and fasting capillary blood levels of glucose, C-peptide, high-density and low-density cholesterol, and triglycerids. Linear regression analyses were adjusted for age, gender, MVPA time, total wear time and country.

Results:

Children spent most of their sedentary time in bouts of short duration (up to 10 min) while sedentary bouts ≥ 20 min were rare. Total sedentary time was not significantly associated with health indicators. Contrarily, associations of accumulated sedentary time with health indicators became stronger with longer bout duration and less tolerance.

Conclusions:

We conclude that especially sitting time accumulated in bouts of uninterrupted sitting may be important for health in children. We, therefore, recommend future studies to focus on sedentary time accumulated in prolonged, uninterrupted sedentary bouts.

S18.3**Assessment of accelerometer non-wear time in children****Authors:**

Nicola Ridgers, Kylie Hesketh, Lauren Arundell, Anna Timperio, Trina Hinkley, Mai Chin A Paw, Ester Cerin, Jo Salmon

Purpose:

Different definitions for determining non-wear time are currently used. The aim of this study was to determine the effect of the definition of ActiGraph and activPAL non-wear time on data retention and the classification of sedentary and sitting time in children.

Methods:

Accelerometer and inclinometer data were drawn from three studies conducted in Victoria, Australia, using comparable protocols. Boys' and girls' ($n=626$) sedentary time was assessed using ActiGraph accelerometers for 8 consecutive days. Sitting time was also assessed using activPAL inclinometers. Four definitions were applied to identify non-wear time: 10, 20, 30 and 60 minutes of consecutive zeros. Descriptive analyses were initially conducted to examine the effects on sample size retention, wear time, and sedentary or sitting time estimates. Univariate ANOVAs were used to determine whether significant differences were apparent in sedentary or sitting time estimates depending on non-wear definitions.

Results:

Using the 10 minute non-wear definition, fewer children were retained compared to the 60 minute definition for both the ActiGraph (487 vs. 509 children) and the activPAL (379 vs. 416 children). Increasing wear time, sedentary time and sitting time were observed with increasing non-wear definitions; significant differences were apparent between all definitions except between the 20 and 30 minute definition.

Conclusions:

Non-wear definitions had a significant impact sample retention, wear time and average daily sedentary time. Researchers should be aware of the influence of non-wear criteria on sedentary and sitting time estimates. Future studies are needed to validate non-wear time definitions in children.

S18.4**From sedentary time to sedentary patterns: Optimal accelerometer data reduction decisions in children****Authors:**

Mai Chin A Paw, Mark de Niet, Maïté Verloigne, Ilse de Bourdeaudhuij, Johannes Brug, Teatske Altenburg

Purpose:

This study aims to establish evidence-based accelerometer data reduction criteria to accurately assess sedentary

patterns in children. We not only examined total sedentary time, but also duration and number of breaks and uninterrupted sedentary bouts.

Methods:

Participants (n=1057 European children; aged 10-12 yrs) wore an ActiGraph accelerometer for at least 6 consecutive days. We explored 1) the most realistic criterion for non-wear time, 2) differences between 8 and 10 hours valid wear time per day; 3) differences between weekday and weekend day regarding total sedentary time, duration and number of prolonged sedentary bouts and the number of breaks; 4) the number of days of accelerometer wear to represent sedentary patterns.

Results:

More than 60 consecutive minutes of zero counts was the optimal criterion for non-wear time, based on frequency of non-wear time periods. Increasing the definition for a valid day from 8 to 10 hours wear time hardly influenced sedentary outcomes while the sample size of children with at least five valid days increased from 69 to 81%. On weekdays children had 1hr more wear time, 50min more total sedentary time, and 26min more sedentary time accumulated in bouts. At least 6 days of accelerometer data were needed to accurately represent sedentary patterns.

Conclusions:

We recommend 1) a minimum of 60 minutes of consecutive zeros as the most realistic criterion for non-wear time; and 2) including at least six days with minimum eight valid hours to characterize children's usual sedentary patterns, preferably including at least one weekend day.

S19

Effects of the IDEFICS intervention: a community-based intervention to prevent overweight and obesity in 8 European countries

Moderator: Ilse De Bourdeaudhuij, Ghent University, Ghent, Belgium

Presenters: Wolfgang Ahrens, Iris Pigeot, Ilse De Bourdeaudhuij, Lauren Lissner

Discussant: Tom Baranowski, Baylor College of Medicine, Houston, Texas, USA

Purpose:

To report for the first time on the general effects of the IDEFICS (Identification and prevention of dietary- and lifestyle-induced health effects in children and infants) intervention.

The IDEFICS study was funded by the European Commission with two aims: (1) To investigate the aetiology of diet- and lifestyle-related diseases and disorders with a strong focus on overweight/obesity in children; (2) to develop, implement and evaluate a setting-based community-oriented preventative intervention programme in 2-9 year old children in eight European countries (Belgium, Cyprus, Estonia, Germany, Hungary, Italy, Spain, Sweden).

A cohort of more than 16000 children - about 2000 per country and equally divided over intervention and control areas - was examined at baseline and 2 years later allowing an evaluation of the effectiveness of the prevention programme. The intervention group received a culturally adapted intervention through the community, schools/kindergartens and family to prevent childhood obesity.

Rationale:

As the IDEFICS intervention is focusing on changing dietary behavior, physical activity, and sedentary behavior, this symposium is in the heart of this conference.

Objectives:

1. Report on the effects on body composition and physiological parameters.
2. Report on the effects on the key behaviors targeted in the intervention.
3. Report on the process evaluation.
4. Put the results in perspective regarding randomised versus non-randomised interventions.

Summary:

The chair will introduce the design, methodology and intervention development of the IDEFICS study.

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The first speaker will address body composition measures and metabolic markers.

The second speaker will address key behaviors: Fruit and vegetable intake; water, soft drink and fruit juice intake; physical activity; TV viewing; and parent-child relationships.

The third speaker will take account of the process evaluation data. First the perceptions of parents on the implementation of the IDEFICS intervention in the schools will be presented. Second the dose-effect relationship between exposure to the intervention and body mass effects will be illustrated.

The fourth speaker will discuss the presumed need to randomise interventions for the primary prevention of obesity.

S19.1

Effects of the two-year IDEFICS community intervention on body composition and physiological parameters in young children

Authors:

Wolfgang Ahrens, Stefaan De Henauw, Staffan Marild

Purpose:

To investigate the effect of the IDEFICS intervention on children's measures of body composition like BMI, waist circumference and bio-electrical impedance and on physiological parameters like blood pressure and insulin resistance.

Methods:

Children underwent a detailed examination protocol, both at baseline (T0) and two years later (T1), including anthropometric measurements and the collection of venous blood. To assess individual changes between measurement values obtained at baseline and at follow-up, mixed models with an additional random effect for the study centre were used to consider the clustered study design in the analyses.

Results:

10,940 children were re-examined at T1 (67.4% of the T0 sample, control n=5,259, intervention n= 5,681) while 5,280 (32.6%) were lost to follow-up. In total 16% of the overweight children became normal weight in the intervention region as compared to only 12% in the control region. In both regions 9% of the non-overweight became overweight. A significant effect of the intervention on body mass index z-scores was only found in girls ($p=0.036$ for the interaction term "time*control-intervention status") with a higher increase in the control areas (0.25 to 0.45) as compared to the intervention areas (0.30 to 0.40). Inconclusive intervention effects were observed for the other parameters under study.

Conclusions:

Although this 2-year large-scale intervention effort revealed only few positive effects, the descriptive results suggest that these efforts might contribute slowly but significantly to the prevention of childhood obesity in Europe. A continued follow-up of this study population will evaluate possible long-term effects.

S19.2

Behavioral effects of a community-oriented setting-based intervention for prevention of childhood obesity

Authors:

Iris Pigeot, Ilse De Bourdeaudhuij, Vera Verbestel

Purpose:

Behavioral effects of the IDEFICS intervention are investigated with regard to the key messages that built the framework of the IDEFICS primary prevention programme.

Methods:

Parents completed questionnaires to measure children's fruit and vegetable intake; water, soft drink and fruit juice intake; daily physical activity; daily TV viewing and other sedentary behaviors; and strengthening of the parent-child relationships. Mixed models with an additional random effect for study centre were used to account for the clustered study design and results were stratified by sex.

Results:

The pan-European analysis did not show any significant intervention effects on the behavior of the IDEFICS children as reported by their parents. Strong temporal effects were found for sedentary behavior showing increases in TV viewing, use of PC/game consoles, as well as in week, weekend and total screen time in both the intervention and control groups. However, country-specific analyses showed positive intervention effects for different behaviors such as on fruit juice intake and sport club participation in Sweden, on fruit intake and doing things together with the family in Germany, on sedentary behaviors in Estonia and Spain, and on fruit juice and water intake, and sedentary behaviors in Belgium.

Conclusions:

Although no overall behavioral effects of the IDEFICS intervention could be observed, favourable effects were found on specific behaviors in single countries. Our process evaluation data are needed to assess the relationship between received intervention dose and its effect on lifestyle changes.

S19.3**Process evaluation of the IDEFICS intervention: Putting effect evaluation in context****Authors:**

Ilse De Bourdeaudhuij, Vera Verbestel, Stefaan De Henauw

Purpose:

To present part of the process evaluation data of the IDEFICS project. The first aim is to report on the perceptions of parents on the implementation of the IDEFICS intervention in the schools. The second aim is to illustrate the dose-effect relationship between exposure to the intervention and BMI effects.

Methods:

The process evaluation steps of Linnan & Steckler (2002) including the components fidelity, dose delivered, dose received, reach, recruitment and context, were used as a theory for building the measurements. Perceptions of parent on these components in the IDEFICS project were gathered through a questionnaire in the intervention communities filled in 1 year after the intervention. BMI was measured in all countries using standardised procedures. In total the sample consisted of 4180 parents.

Results:

The dose received by the parents was considerably higher through the schools than through the community. About 90% of the parents received a lower dose than was intended. Results showed that efforts by the schools or communities, and parental involvement related to fruit and vegetable consumption, physical activity promotion and drinking water were higher than those related to TV viewing, sleep duration and spending time with the family. No clear dose-response relationship was found. No impact of exposure to parents at the school and the community level was related with more favourable effects on BMI z-scores.

Conclusions:

Reaching parents of young children to prevent overweight is difficult, but more easy through schools than through communities, and more easy for some behaviors than for others.

S19.4**Effects of multi-level interventions in randomized versus non-randomized studies: Lessons learned from the IDEFICS intervention.****Author:**

Lauren Lissner

Purpose:

Based on the Cochrane review by Waters et al. (2011) on the observed effects of randomized versus non-randomized interventions, the IDEFICS intervention will be critically assessed.

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Methods:

Based on the Cochrane review, the design, selection and execution of control/comparison groups for intervention studies will be illustrated. The IDEFICS example will be compared with the interventions included in the review. The difference between randomized/non randomized and controlled versus not controlled will be outlined.

Results:

The IDEFICS intervention was not randomized; rather intervention and control communities in each survey country were matched for socio-demographic characteristics. Our results will be considered in the context of previous evidence from randomised and non-randomised prevention trials in children.

Conclusions:

The issue of control groups in multi-level research will be discussed, as well as the issue of randomized versus non-randomized trials in community based intervention studies. Lessons learned for the future will be outlined.

S20

Informing interventions to improve women's health before during and after pregnancy

Moderator: Jennifer L Huberty, Arizona State University, Phoenix, Arizona, USA

Presenters: Jennifer Huberty, Christina Campbell, Michelle Mottola, Jenn Leiferman

Discussant: Emily Mailey, Kansas State University, Manhattan, Kansas, USA

Purpose:

To share data to inform the development of innovative interventions to improve women's health before, during, and/or after pregnancy.

Rationale:

At least one third of women are overweight or obese prior to pregnancy, with most not meeting recommendations for regular physical activity (PA) or healthy eating. Overweight/obesity is one of the most common high-risk obstetric conditions, compounded by decreased activity as pregnancy progresses. Among adult women, the greatest increase in obesity prevalence occurs at the end and immediately following the childbearing years (ages 35-44 years), making this an important time for promoting positive health behaviors (PA and healthy eating). Unfortunately, little progress has been made to produce significant changes in women's health behaviors before, during, and after pregnancy. Identifying multiple intervention strategies that consider the specific needs of various subpopulations is warranted. This symposium will emphasize innovative approaches that improve women's engagement in PA and healthy eating before, during, and/or after pregnancy.

Objectives:

The panel will: 1) Present the latest evidence on improving health behaviors of women before, during, and/or after pregnancy, 2) emphasize innovative approaches that incorporate varying levels of the Social Ecological Model (SEM), and 3) facilitate discussion on the implications for future health promotion efforts.

Summary:

Dr. Jennifer Huberty (USA) will discuss a novel, technology-based approach, namely text-message referral to evidence-based, mobile-friendly websites, to improve PA behaviors across the gestational period among previously sedentary pregnant women (individual level). Dr. Christina Campbell (USA) will discuss the need for multiple intervention strategies to improve the health of pregnant women, with special attention on how and why various strategies may be effective for some women but not for others (individual level). Dr. Michelle Mottola (Canada) will present findings related to the prevention of excessive gestational weight gain and postpartum weight retention, including discussion of the need to target women at preconception or earlier in pregnancy, provide women with increased postpartum support for health behaviors, and engage family members in women's health behavior change (interpersonal/community levels). Dr. Jenn Leiferman (USA) will present data on the attitudes, beliefs, and practices of health care providers related to the promotion of PA and healthy eating in pregnant women, including recommendations for improved communication between providers and patients for health promotion during pregnancy (organizational/policy levels). Discussion, led by Dr. Emily Mailey, will review the future research implications of the presentations with an emphasis on multilevel approaches that integrate individual, interpersonal, and community-level strategies.

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S20.1

Developing text-messages for referral to evidence-based websites to improve physical activity in pregnant women

Author:

Jennifer Huberty

Purpose:

Over 90% of women own a mobile phone and most report text messaging as a preferred mode of communication. Research suggests women use the Internet for physical activity (PA) related pregnancy information. Directing pregnant women to evidence-based websites via text messaging may provide an innovative approach to PA participation. Currently one text messaging health service exists for pregnant women: Text4baby (t4b). However, t4b's protocol lacks PA information and does not include referral to evidence-based websites. The purpose of this study was to develop text messages for a feasibility study (partnership with t4b) using mobile phone text-messaging to refer women to evidence-based PA websites.

Methods:

Text messages were developed using: (1) Literature review, (2) interviews with active pregnant women, and (3) American College of Sports Medicine's Behavioral Aspects of Exercise textbook. Evidence-based websites associated with each text were selected using research team expertise, interview findings, and Health on the Net Code principles.

Results:

Seven text messages with links to evidence-based websites were developed and encompass the following topics: Basic education and information (e.g., exercise safety, benefits for mom and baby), activity ideas (e.g., modifications, lifestyle-based), encouragement and motivation (e.g., reminders, accountability), and social networks for activity with other pregnant women/moms.

Conclusions:

The text messages will be used to determine the feasibility of a mobile-phone text messaging intervention to increase PA in pregnant women. Findings will inform t4b's national protocol. With approximately 650,000 users, t4b provides a promising, low cost, strategy that may help improve PA levels of pregnant women nationally.

S20.2

Carbohydrate intake and total physical activity predict appropriate gestational weight gain in pregnant women

Author:

Christina Campbell

Purpose:

Previous efforts to prevent excessive gestational weight gain (GWG) have focused on promoting moderate physical activity (PA) and/or controlling dietary intake. To determine a profile necessary to achieve appropriate GWG, lifestyle should be assessed with regard to total daily activity and diet. A prospective, observational study was conducted to identify modifiable aspects of total PA (sedentary, light, moderate, and vigorous) and diet to predict appropriate GWG.

Methods:

During weeks 18 and week 35, 46 pregnant women wore the activPALTM and SenseWear® Mini Armband 24 hours/day. Time spent in all intensities of activity (sedentary, light, moderate, and vigorous), total sleep duration, steps, and total activity in MET-minutes per day were collected. A weighed 3-day diet record was used to assess total energy, macronutrient intake, and diet quality at each time point. GWG was determined using self-reported pre-pregnancy weight and the measured weight at each time point. Prediction models for GWG at week 35 ($P < 0.1$) were developed using multiple and stepwise regression.

Results:

Across all pre-pregnancy BMIs, 46% gained in excess of the 2009 IOM guidelines by week 35. Total MET-minutes (min·d⁻¹) ($P = 0.038$) and carbohydrate (CHO) intake (g·d⁻¹) ($P = 0.098$) were the best predictors of GWG at week 35.

Conclusions:

Various lifestyles can lead to appropriate GWG based on differing PA levels and CHO intake. This preliminary prediction model provides a basis for further study on the effectiveness of individualized diet and activity prescription to achieve appropriate GWG.

S20.3**Promoting patient-provider communication on prenatal exercise and healthy eating****Authors:**

Jenn Leiferman, Jessica Kendrick

Purpose:

To conduct a randomized-controlled trial to test the effects of educational web-based modules on patient-provider communication pertaining to healthy eating and physical activity. The hypotheses were that upon completion of the modules, healthcare providers (HCPs) would report increased knowledge about national recommended guidelines and evidence-based practices as well as higher quality and frequency of communication on healthy eating and physical activity.

Methods:

Twenty-five HCPs (e.g. 13 obstetricians and 12 midwives) and 40 patients were recruited. HCPs were randomly assigned to the intervention or active control group. Survey data were collected at baseline and 8 weeks post-baseline on HCPs' and patients' attitudes, beliefs, current behaviors/practices, and quality of communication pertaining to healthy eating and physical activity.

Results:

Overall, HCPs indicated they talked with their patients about these behaviors but more often in the first trimester. However, only half of their patients stated their HCP talked about these behaviors and many were dissatisfied with the quality of communication. The effects of these trainings on provider communication and practices as well as patient health behaviors will be discussed.

Conclusions:

Establishing effective interpersonal and communication skills during early prenatal visits will help build rapport between the provider and patient early in the pregnancy; which in turn, may increase the likelihood of adherence to anticipatory guidance throughout the perinatal period.

S20.4**A family-based Nutrition and Exercise Lifestyle Intervention Program (NELIP) to prevent excessive maternal weight gain and minimize weight retention****Author:**

Michelle Mottola

Purpose:

Women of childbearing age are at an increased risk for developing obesity. To prevent excessive gestational weight gain and minimize weight retention in overweight (pre-pregnancy BMI=25.0-29.9 kg/m²) and obese (pre-pregnancy BMI≥30.0 kg/m²) women, a family-based Nutrition and Exercise Lifestyle Intervention Program (NELIP+FBBT) was initiated at 16-20 weeks gestation and then re-initiated at 2 months post-delivery until 1 year.

Methods:

Nutrition was based on the gestational diabetic meal plan and exercise consisted of a controlled walking program at a target heart rate (30% aerobic capacity) starting at 25 minutes per session, increased each week by 2 min up to a maximum of 40 min, 3-4 times/wk. Pedometers were worn as a motivator. The family-based component focused on strategies to make healthy lifestyle choices. Each set of group sessions presented educational information and/or behavioral

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strategies. At 2 months post-delivery the family-based NELIP was re-initiated including information regarding breast-feeding and infant feeding practices as well as a stroller walking program which continued until 1 year postpartum.

Results:

Maternal weight gain on the family-based NELIP was 6.2 ± 4.5 kg with a rate of 0.36 ± 0.3 kg gain/week. By one year post-delivery, maternal weight retention was 1.2 ± 7.5 kg.

Conclusions:

Preliminary results would suggest that a two-pronged approach specifically aimed at prevention of excessive gestational weight gain through a healthy lifestyle intervention and then re-initiated at 2 months post-delivery, followed through until one year, may be a successful tool in obesity prevention.

S21

Mobile health interventions: Bringing health behavior theories into the 21st century

Moderator: Heather Patrick, National Cancer Institute, Bethesda, MD, USA

Presenters: Heather Patrick, Debbie Thompson, Ralph Maddison, David Lubans

Discussant: Donna Spruijt-Metz, University of Southern California, Los Angeles, CA, USA

Purpose:

This symposium will present four studies that have used traditional health behavior theories in mHealth interventions targeting diet, physical activity and/or weight management.

Rationale:

Over the past quarter century, increasing emphasis has been placed on the use of theory in health behavior research. Indeed, one of the hallmarks of quality interventions is the extent to which they are grounded in and informed by theory. Theory is critical to intervention research because it may illuminate how, why, for whom and under what circumstances interventions operate. Further, theory provides more proximal targets for intervention by identifying variables in the pathway to behavior change and maintenance. The recent emergence and proliferation of technology for use in health behavior interventions (e.g., mobile health) has provided an unprecedented opportunity to bring to scale known-efficacious, theory-based interventions to maximize population reach and public health impact. However, measurement limitations and the relatively slow pace of theory-based research has led some to question the utility of traditional health behavior theories in the digital landscape.

Objectives:

This symposium aims to (1) provide evidence for the utility of health behavior theory in informing mHealth interventions and (2) discuss how findings from mHealth can loop back to inform theory.

Summary:

Dr. Patrick will present preliminary results from a study of the effectiveness of self-determination theory (SDT)-based content in promoting diet, physical activity and/or weight management among women trying to quit smoking, using a mobile-optimized website and social media. Dr. Thompson will present findings from a pilot study of an SMS, SDT-based program to promote physical activity among 14-17 year olds. Dr. Maddison will present results from a mobile phone and internet intervention to promote physical activity among adults with cardiovascular disease, based on social cognitive theory (SCT). Dr. Lubans will present results from a feasibility trial using a mobile application to promote physical activity and decrease sedentary time among adolescent boys, based on SDT and SCT. The session will conclude with a counterpoint discussion by Dr. Spruijt-Metz about how data from the mobile technologies used in each of the four presentations could be used to inform the revision of existing health behavior theories and the development of new, integrated and flexible theoretical models that capitalize on the potentials of mobile health.

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S21.1

Applying self-determination theory for diet and physical activity in an online smoking cessation resource

Authors:

Heather Patrick, Erik Augustson

Purpose:

To present preliminary results from a pilot test of self-determination theory (SDT)-based diet, physical activity and weight management content in the context of an online smoking cessation resource - women.smokefree.gov.

Methods:

Smokefree Women was revised and re-launched in May 2013. The new website was mobile-optimized for improved user interface on multiple platforms (e.g., desktop computer, mobile phone) and to enhance social media engagement (e.g., Facebook, YouTube). This redesign also included new content for diet, physical activity and weight management, based on known-efficacious interventions using SDT. A pre-test/post-test pilot study is being conducted to determine (a) whether this content yields improvements in targeted health behaviors, (b) whether those who engage with the lifestyle behavior content exhibit greater tobacco abstinence and (c) the optimal intervention dose needed to improve lifestyle behaviors.

Results:

Following the relaunch and a brief promotional campaign, visits to the website increased by nearly 400%, with an analogous uptick in social media engagement. Preliminary evidence from qualitative data suggests active engagement with the lifestyle and weight management content. Data collection for the pilot study is ongoing.

Conclusions:

Smoking cessation may be an optimal time to intervene on other health behavior risks common to smokers, namely poor diet, physical inactivity and post-cessation weight gain - which remains a major barrier to smoking cessation for women. Resources that address these other health behaviors (i.e., diet, physical activity) and health risks (i.e., overweight) are needed within smoking cessation interventions to improve cessation rates and former smokers' overall health.

S21.2

Texting to increase physical activity in teens: Development & preliminary

Author:

Debbe Thompson

Purpose:

To present formative research and preliminary results for a self-determination-theory (SDT)-based text messages to promote physical activity (PA) among teens.

Methods:

Thirty 14-17 year olds, stratified by gender and race/ethnicity (Black, Hispanic, White) were recruited to participate in two rounds of formative research. The first round obtained information about issues such as preferred time to receive texts, family/school texting rules, content/focus of messages, and personal values. SDT-based texts were then developed promoting autonomy (volition), competence (efficacy), and relatedness (connection to self and others). Texts (i.e., prompts) were also developed as reminders to set a pedometer (i.e., step) goal. An expert professional panel reviewed the texts for theoretical adherence and teen appeal. A second round of formative research was then conducted with teens for their perspective.

Results:

Formative research indicated teens wanted texts to be short, straightforward, realistic, and use emoticons or exclamation points to convey emotion. Twelve text goal-setting prompts and 72 SDT-based text messages promoting PA were developed; SDT-based texts were divided equally between autonomy, competence, and relatedness support. One hundred

sixty teens participated in a 12-week pilot feasibility study. They were randomized to one of 4 groups (no-treatment control, pedometer only, pedometer + prompts, pedometer + prompts + SDT-texts). Preliminary results suggest the pedometer + prompts + SDT texts group had the greatest improvements in PA (7 days of accelerometry).

Conclusions:

SDT-based texts show promise as a method for increasing PA in teens. Additional research is needed to address behavioral maintenance.

S21.3

A social-cognitive theory-based mobile health intervention to promote physical activity in cardiovascular disease patients

Author:

Ralph Maddison

Purpose:

To evaluate a social cognitive theory-based mobile health (mHealth) exercise program in New Zealand adults with cardiovascular disease.

Methods:

A two arm, parallel, single blinded randomized controlled trial was conducted. Participants (n=171) were randomized at a 1:1 ratio either to receive a usual care plus mHealth intervention or usual care alone (control). The mHealth program was delivered over six months and consisted of text messages using social cognitive theory behavioral change strategies and support. Intervention content focused on increasing participant's efficacious beliefs to be active, overcome barriers to exercise and increase motivation. Participants also had access to an interactive website containing text and video messages to increase and maintain regular exercise behavior. Usual care involved encouragement to be physically active and an offer to join a local cardiac club. Follow-up was at 6 months and included, peak oxygen uptake (PVO2), self-reported physical activity, self-efficacy, motivation to exercise and health related quality of life (HRQOL).

Results:

There were no statistically significant differences between treatment groups in PVO2 increase. However, significant differences were found for leisure time physical activity, time spent walking, task efficacy and motivation, as well as the general health domain of health-related quality of life, in favor of the intervention.

Conclusions:

A social cognitive theory-based mHealth intervention was effective at increasing physical activity in people with cardiovascular disease. This effect may be mediated by increases in self-efficacy and motivation. The exercise prescription was not intense enough to show a positive effect on physical fitness.

S21.4

Description and feasibility of a smartphone application to promote physical activity and reduce sedentary behavior in adolescent boys

Authors:

David R. Lubans, Jordan J. Smith, Philip J. Morgan, Ronald C. Plotnikoff, Kerry Dally, Jo Salmon, Anthony D. Okely, Geoff Skinner

Purpose:

The purpose of this presentation is to describe the development and feasibility of a smartphone application (app) designed to promote physical activity and reduce screen-time in adolescent boys 'at risk' of obesity.

Methods:

A smartphone app was developed to support the delivery of the Active Teen Leaders Avoiding Screen-time (ATLAS)

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obesity prevention program. ATLAS was guided by self-determination theory and social cognitive theory and was evaluated using a cluster randomized controlled trial with 361 boys (12.7±0.5 years) in 14 secondary schools. The ATLAS app was purpose built for the study and includes the following features: (i) Physical activity monitoring using step counts; (ii) CrossFit-style fitness challenges; (iii) Resistance training skill competency assessment; (iv) Goal setting for health behaviors; and (v) Tailored motivational messaging. Participants in the intervention group completed mid- and post-program process evaluations to determine feasibility.

Results:

Participation in the study was not contingent on ownership of a smartphone, but 70% of participants in the intervention group reported owning a smartphone at baseline. At mid-program evaluation, 49% and 15% of participants had used the iPhone and Android apps, respectively. At posttest, half of the participants agreed or strongly agreed that the motivational messages reminded them to be more active and reduce their screen-time. The goal setting function was used by 85% of participants to increase their physical activity or reduce their screen-time.

Conclusions:

The app appeared to motivate the participants to change their behavior, but further strategies and features may be needed to enhance self-monitoring in adolescent boys.

S22

How immigrant women and families navigate and negotiate health and nutrition practices

Moderator: Jamie S Dollahite, Cornell University, Ithaca, NY, USA

Presenters: Amanda McClain, Pamela Weisberg, Laura Terragni, Kia Ditlevsen

Discussant: Jess Haines, University of Guelph, Ontario, Canada

Purpose:

To explore and discuss how immigrant women and families manage the influence of their competing cultures, daily lives, and environments to inform health practices, particularly food choice. This session uniquely provides an emic perspective to elucidate the complex dynamics of health and nutrition practices in immigrant families living in developed countries.

Rationale:

Developed nations like Europe and the United States are the receiving communities for many foreign-born populations from developing and transition countries. A variety of social, political, and economic factors drive migration and impact immigrants' transition to life in the destination community, often resulting in socioeconomic disadvantage, stress, and marginalization. Data on the effect of immigration on health is conflicting, emphasizing the importance of research on the nuances of health behaviors especially nutrition. As dietary acculturation to the receiving country increases, so do the risk factors for chronic disease. Thus, research on health and nutrition practices of immigrants is of interest to the future health and productivity of receiving nations. Understanding how immigrants construct practices and related behaviors can inform future nutrition interventions and recommendations to improve immigrant health and well-being.

Objectives:

This session will focus on health and nutrition practices, namely related to food choice, among immigrant women and families by:

1. Illustrating the interplay of important cultural and structural influences on health and nutrition practices
2. Differentiating practices and related influences that potentially promote versus discourage health and well-being
3. Demonstrating innovative qualitative methods and theoretical approaches for nutrition research with immigrants
4. Identifying future strategies and approaches to encourage healthful practices and behaviors

Summary:

This session will present qualitative findings on how different groups of immigrant women and families in Norway, Denmark, and the U.S. construct health and nutrition practices, with emphasis on important influences to consider in future research and programming. Such influences include family roles and dynamics, parenting styles and practices, food and social environments, socioeconomic status, and the cultural identity and norms of both the origin and receive-

ing countries. Discussion will center on how these findings can contribute to healthier nutrition and health practices among immigrant communities.

S22.1

Contextual influences on food security and use of coping strategies among low income, urban and rural Mexican-origin mothers living in New York State

Authors:

Amanda C McClain, Jamie Dollahite

Purpose:

To elucidate perceived influences on barriers and coping strategies to ensuring food security among recent, low-income Mexican-origin immigrant mothers in New York State. This project is unique in that ecological and life course perspectives guide interviews with Mexican-origin mothers living in the northeastern U.S. Context-specific data are needed for intervention design but lacking in the northeast, despite experiencing recent growth of this at-risk population.

Methods:

This study used in-depth semi-structured interviews with key community informants and low-income Mexican-origin mothers with children <5 years. Purposeful sampling included mothers residing in 1) U.S. <5 years vs. 6 -10 years, and 2) rural vs. urban areas. Mothers completed three in-depth interviews, the second being a participant-driven photo elicitation, in their preferred language (Spanish or English). Photo elicitation enhances traditional interview methods and allows the participant to bring attention to important issues rather than the investigator identifying them a priori. Key informants completed one interview. Analysis of transcripts identified emergent themes using a constant comparative approach.

Results:

Social networks, time in the U.S., language proficiency, urban/rural location, marginalization, and nutrition education collectively influence knowledge and use of coping strategies. For example, mothers' greater financial capital in the U.S. to purchase food comes at the expense of losing efficiency in provisioning and processing food due to culturally-unfamiliar foods and limited access/availability of traditional Mexican foods.

Conclusions:

Findings suggest that programs to reduce food insecurity in Mexican-origin families should consider lifestyle in the country of origin as well as current food and social environments.

S22.2

Women's construction of food activity space

Authors:

Pamela Weisberg, Carol Devine

Purpose:

The purpose of this research was to understand how Dominican born women living in New York City choose food establishments. Little is known about how residential food environment limits food purchasing behavior. Research assumes that food purchasing behavior is limited to residential neighborhood, however, this research examines actually purchasing behavior and investigates the decision process associated with choosing food establishments.

Methods:

Dominican born women (n=23) participated in two qualitative interviews addressing food purchasing behaviors. The first interview was conducted in a private space and the second interview was a 'go along' interview, conducted as the woman provided a tour of her food environment. The data were analyzed using a grounded theory approach and constant comparative method.

Results:

Findings indicate that women construct a food activity space based on their residential food environment, the location of daily or weekly activity, perceived time available to shop and values. Values reported by women include proximity to activities (i.e. home, work), food quality, prices and cleanliness of the store. Balancing these variables, women reported shopping at multiple stores, shopping in neighborhoods outside of their residential neighborhood or traveling long distances to find better quality or prices.

Conclusions:

The construction of food activity space indicates that the food environment of these women is not limited to residential food environment. This provides increased access to more healthy and unhealthy foods. Therefore, in an effort to understand the relationship between food environment and health it is important to consider the environment beyond the residential area.

S22.3**Feeding the family between two cultures: A qualitative study among immigrant women living in Norway and their experiences with meal preparation****Author:**

Laura M.E. Terragni

Purpose:

The aim of this paper was to investigate food acculturation among immigrant families living in Norway with a particular focus on how women from different ethnic backgrounds performed the activity of feeding their families.

Methods:

The study utilized a qualitative research design. Participants were women who migrated from Asia, Africa and Middle East as adults and resettled in low-income areas in Oslo. Data were gathered from July of 2010 to February of 2012 through 21 semi-structured interviews. Interviews based on photos of meals and eating events were also conducted on a smaller sample. Transcribed interviews were coded and thematically analyzed using a phenomenological approach.

Results:

Our findings highlight the importance of the family as an analytical category in understanding food habits after migration. Women experienced feeding the family as a balance between different family members' preferences and orientations. In the presence of husbands or extended family members, feeding activities were guided by ideals that reproduced gender roles and maintained cultural identity. The significance of traditional meals was underlined. When women lived alone with their children, they were more prone to explore the food culture of the host country. Children played an important role in introducing new food and food habits to the family.

Conclusions:

Nutritional advice towards ethnic minorities could benefit by addressing the family as a whole. Of particular relevance for implications for practitioners is role of children as mediators between the food culture of the host country and that of the country of origin.

S22.4**Parenting styles and health promoting behavior in families in insecure living conditions****Authors:**

Kia Ditlevsen, Annemette Nielsen

Purpose:

This qualitative study explores parenting styles and everyday health practices in families with non-Western ethnic minority background, living under precarious conditions in Denmark; and the understandings of appropriate parenthood, presented by health care professionals.

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Following questions will be addressed in the presentation:

- How “appropriate parenting” is presented by professionals working with childhood weight interventions;
- How vulnerable families respond to this idea of good parenting in their everyday life;
- Whether there is a (theoretical) link between family conditions and parenting; and
- What are the implication for health promotion initiatives?

Methods:

A grounded theory approach is adopted in this explorative study, based on qualitative semi-structured interviews with Danish health care professionals and families with immigrant/refugee background and overweight preschool children.

Results:

Preliminary results suggest that the families’ practice rejects the professionals’ concept of “good parenting”, as their goal is not health promotion, but rather “instant wellbeing” and comforting.

Conclusions:

To adequately understand weight problems among preschool children and the underlying dynamics, we need to look at the family level, including socioeconomic conditions and family history, together with the key concepts parenting style and parental feeding practice. Interventions attempting to promote healthy life styles in vulnerable families may have better chance of success, taken knowledge on everyday practice into account and thus being able to speak to the dynamics and logic of the families.

S23

Assessment of the school PA environment

Moderator: Stephanie Broyles, Pennington Biomedical Research Center, Baton Rouge, LA, USA

Presenters: Stephanie Broyles, Teatske Altenburg, Flo Harrison, Jasper Schipperijn

Discussant: Andrew P Jones, University of East Anglia, Norwich, Norfolk, UK

Purpose:

School is an important setting for physical activity (PA), but it is unclear whether particular features may promote or inhibit PA. Until recently, few methods to assess the school environment existed. This symposium will consider objective methods for assessing the school PA environment. These methods are less-developed than those used to assess other PA environments, such as parks and neighborhoods. Several recent research efforts have incorporated school environmental assessments across different settings (e.g., primary vs. secondary schools, different countries). Speakers will discuss issues of assessment, practical suggestions for conducting school assessments, and associations with outcomes. An overarching goal is to identify promising areas for assessments of the school PA environment, and to provide direction for future research.

Rationale:

School-focused efforts to increase youth PA levels will benefit from having valid, reliable, and responsive objective measures of the school PA environment.

Objectives:

1. To assess the state of the science regarding objective assessment of the school PA environment.
2. To consider instruments and methods to evaluate the school PA environment.
3. To discuss promising areas of school environmental assessments and those where methodological development is needed.

Summary:

Introduction: Stephanie Broyles, Ph.D. will provide a general introduction and a brief overview of the studies and settings.

Presentation 1: Stephanie Broyles, Ph.D. will present findings on reliability and variability of measured aspects of the school environment drawing from the ISCOLE study.

Presentation 2: Teatske Altenburg, Ph.D. will describe the reliability for rating characteristics of school environments according to a photo-based protocol used in the ENERGY project.

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Presentation 3: Flo Harrison, Ph.D. will present results from SPEEDY on instrument stability and associations with change in PA across primary and secondary schools

Presentation 4: Jasper Schipperijn, Ph.D. will present findings of GPS-accelerometer based analyses of schoolyard physical activity during recess using pilot data from the Activating Schoolyards Study

Discussion: Andy Jones, Ph.D.

Prof. Jones will summarize the current issues in conducting school environmental assessment and the promising areas in using results to explain cross-sectional and longitudinal levels of youth PA. He will lead a participatory discussion and Q&A session related to the prior presentations, with a focus on developing research priorities.

S23.1

Reliability and variability of assessed sports/play features in a multi-national study: The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE)

Authors:

Stephanie Broyles, Kathryn Drazba, Peter Katzmarzyk

Purpose:

To examine reliability and variability of objectively-measured aspects of the school physical activity environment across 247 schools in 12 countries, representing both the developed and developing world.

Methods:

Audits of the school physical activity and nutrition environment were conducted by trained data collectors for all schools participating in the International Study of Childhood Obesity, Lifestyle, and the Environment (ISCOLE). This analysis presents results pertaining to features supporting sports/play. The availability and quality of eight features supporting sports/play were assessed as present and functional, present but non-functional, and not available. Inter-rater reliability was assessed in 52 of the schools, representing a minimum of 5% (median=8%) of the country-specific school samples. The amount of variation occurring within sites vs. between sites (ICC) was assessed using multilevel (random-effects) logistic regression models.

Results:

Audits of the school environment were conducted in 246 schools attended by 10-year-old children (4 to 29 schools per country). For the eight sports/play features, item-level inter-rater reliability (kappa) ranged from 0.80 to 0.99. Of the eight sports/play features assessed, two to six showed low variability (present in <10% or >90% of schools) within the country-specific school samples. Across all features, there was significant variability across countries in average availability of features (ICC range: 35% to 76%).

Conclusions:

Features of the school physical activity environment can be reliably assessed across diverse country settings. However, it is unclear whether the items assessed in the current instrument will have sufficient within-country variability to correlate with student physical activity levels.

S23.2

Change in school environment and change in children's physical activity; assessment with a validated school audit tool

Authors:

Flo Harrison, Andy Jones, Kirsten Corder, Esther van Sluijs

Purpose:

Objective measurement of school environments is important in determining how they impact children's physical activity. We have previously developed and tested an audit tool to assess the opportunity for physical activity in primary

schools. This study aims to test the validity of the same audit tool in secondary schools and to examine if and how children's physical activity changes as they move between schools with differing levels of supportiveness.

Methods:

The original 44 item tool was developed and tested at 92 primary schools in the county of Norfolk, England, during summer term of 2007. These schools were attended by 2064 participants in the SPEEDY study, who were followed up four years later at their secondary schools. The audit was repeated at 47 secondary schools. Initial analysis compared the audit scores across 6 domains of facility provision between primary and secondary schools. Subsequent analysis will assess how children's school-time accelerometer-measured physical activity is related to changes in school audit scores.

Results:

Comparing the scores of primary schools and secondary schools we saw few differences. Secondary schools had lower scores for 'Sport and play facilities' (6.0/17 vs 8.1/17, $p < 0.01$), but similar mean values for walking and cycling provision, other facilities, design of grounds, and aesthetics. Physical activity measurements on school days from both study phases are available for 350 participants.

Conclusions:

Overall the SPEEDY school audit found few differences in physical activity supportiveness between primary and secondary schools. Further analysis of school-time physical activity measurements will explore the implications of this.

S23.3

Mapping schoolyard behavior using GIS, GPS and accelerometers

Authors:

Jasper Schipperijn, Henriette B Andersen, Charlotte Demant Klinker

Purpose:

To investigate how schoolchildren use different schoolyard areas and whether these areas are associated with different types of behavior. Schoolyard characteristics seem to be related to behavior during recess, but exactly which behavior takes place where is unclear.

Methods:

Time spent by 316 students (grade 5-8) in 5 types of schoolyard area was measured using global positioning system (GPS, QStarz BT-Q1000x) and the level of activity was measured using accelerometers (ActiGraph GT3X). Schoolyards were mapped in detail using a high precision GPS (Trimble GeoExplorer XT) and ArcGIS mobile. Total time and proportions of time spent sedentary and in moderate-to-vigorous physical activity (MVPA) were calculated per area type.

Results:

Significant differences in activity levels were found. Grass and playground areas generated the greatest proportions of MVPA and solid surface areas had the highest proportion of time spent sedentary and the lowest proportion of MVPA. Boys and children generally spent a higher proportion of time in MVPA. Girls accumulated significantly more sedentary time in all types of area compared to boys.

Conclusions:

This finding emphasizes the importance of investigating the potential of the various settings and features in the schoolyard in promoting physical activity. Grass and playground areas may play an important role in promoting physical activity in schoolyards, while a high proportion of time in solid surface areas is spent sedentary. Future studies might want to consider a combination of GPS, accelerometer and direct observation as this would enable determining which types of play are associated with MVPA or sedentary behavior.

S23.4

Inter-rater reliability of the ENERGY photo-rating instrument for school environments

Authors:

Teatske Altenburg, Saskia te Velde, Kai-Jan Chiu, George Moschonis, Ilse de Bourdeaudhuij, Nanna Lien, Johannes Brug, Mai Chin A Paw

Purpose:

The school environment can play an important role in the prevention of childhood overweight and obesity. Photos of the school environment may contribute to more adequate measurement of the school environment. The aim of this study was to examine the inter-rater reliability for rating characteristics of school environments related to physical activity.

Methods:

Photos of the school environment were taken as part of the ENERGY audit instrument. Photos at 172 primary schools in seven European countries (i.e. Belgium, Greece, Hungary, the Netherlands, Norway, Slovenia and Spain) were rated independently by two researchers according to a standardized protocol (i.e. ENERGY photo-rating instrument). Inter-rater reliability was assessed using the intra-class correlation coefficient (ICC).

Results:

Four out of five subsections of the photo-rating instrument showed excellent ($ICC \geq 0.81$) or good (ICC or Cohen's kappa 0.61-0.80) inter-rater reliability (i.e. school yard, indoor physical activity facilities, physical activity equipment and bicycle parking areas). Outdoor physical activity facilities showed moderate inter-rater reliability ($ICC = 0.56$).

Conclusions:

Inter-rater reliability of the ENERGY photo-rating instrument was adequate for four out of five characteristics of primary school environment components related to physical activity. The ENERGY photo-rating instrument might be an important tool that can be used in future school-based interventions, to visualize opportunities for physical activity within the school environment.

S24

Physical activity in an ultra-dense environment: What factors matter?

Moderator: Stephen H. Wong, Chinese University of Hong Kong, Shatin, Hong Kong

Presenters: Wendy Huang, Ester Cerin, Cindy Sit

Discussant: Patrick W.C. Lau, Hong Kong Baptist University, Kowloon, Hong Kong

Purpose:

This symposium aims to address the ecological and environmental issues of physical activity for under-researched population living in an ultra-dense geographical location.

Rationale:

The existing literature has been mainly generated from relatively homogeneous Western environments. The uniqueness of social-cultural and physical environment in Asian ultra-dense metropolises may have direct or indirect impact on physical activity behaviors in undocumented ways. The findings not only shed light on potential targets for PA promotion for local people (local relevance), but also contribute into the literature by extending the urban density spectrum to a higher end when examining environment-PA relationships.

Objectives:

1. To address the need for geographical specificity in studying environmental correlates of PA; 2. To establish collaborations and a network for ecological research of PA for Asian populations.

Summary:

This symposium will consist of three presentations covering multilevel and multivariate investigation into the determi-

nants of PA for Chinese people in Hong Kong, i.e., individual, social and physical environment in the neighborhood as well as the school environment. The study to be presented by Dr. Wendy Huang and colleagues found an obvious decline of total PA over a 12-month period for children aged 7-10 years old. This study also indicated that certain aspects of objectively-assessed physical environment predicted changes of PA in different ways from those that have been reported in the literature. Prof. Ester Cerin will present a study examining the associations of education and socio-economic status with walking behaviors for the elderly. Her results have identified people with low education level as a potential target for PA promotion and suggested that the interventions should also consider several environmental attributes. Prof. Cindy Sit's presentation will focus on children with disabilities. The findings from her study have highlighted that PA in disabled children was influenced by contextual characteristics of the school environment, which are potentially modifiable.

S24.1

Objectively-assessed and perceived neighborhood environment and changes of physical activity over 12 months among Hong Kong Chinese children

Authors:

Wendy Y. Huang, Stephen H. Wong, Ester Cerin, Poh-Chin Lai

Purpose:

To examine the associations of objectively-assessed and perceived neighborhood environment with 12-month change in physical activity (PA) among Chinese children in Hong Kong.

Methods:

Data were from a longitudinal study Understanding Children's Activity and Nutrition (UCAN). Children wore an Acti-Graph monitor for eight consecutive days in 2010 and one-year later (N=412). Parents of the participating children completed a questionnaire on perceived environment in the neighborhood (availability of sport facilities, traffic safety and local destinations). Geographic Information System (GIS)-determined variables included nearest distance (both street network and crow-fly) to parks and recreational destinations, road length, road intersection density, and percent of bicycle track area. Associations between predictors and change in PA were examined using linear mixed models. Interactions with sex, area socio-economic status and area walkability were also studied.

Results:

Total PA during weekdays (TPA, mean cpm) declined. None of the perceived environment variables predicted changes in PA. After controlling for age, sex, parental education, marital status and baseline values, the nearest street network distance to recreational destinations was positively associated with changes in TPA and vigorous PA during weekday for children from high-walkable areas. Percent of bicycle track area was negatively related to change of total PA on weekend days for children living in low walkable areas.

Conclusions:

Objectively-assessed environmental determinants of PA change differed for weekday and weekend days. PA interventions may need to consider the type of neighborhood. Future research should identify perceived PA-related neighborhood factors specific to the context of Hong Kong.

S24.2

Socio-economic status, neighborhood characteristics, and walking within the neighborhood among older Hong Kong Chinese

Authors:

Ester Cerin, Robin Mellecker, Duncan J. Macfarlane, Anthony Barnett, Man-chin Cheung, Cindy HP Sit, Wai-man Chan

Purpose:

We examined the associations of educational attainment and area socio-economic status (SES) with total within-neighborhood walking patterns and percentage of walking undertaken for recreation purposes in Hong Kong elders. Environmental mediators of these associations were also examined.

Methods:

Chinese-speaking elders (N=484), cognitively unimpaired and able to walk unassisted, were recruited from 32 street blocks in Hong Kong. These street blocks were stratified by SES and transport-related walkability. Interviewer-administered surveys were conducted to collect data on walking and socio-demographics. Neighborhood environments were audited using a validated tool appropriate for Asian ultra-dense urban environments.

Results:

Educational attainment was positively related to walking outcomes, while area SES was only positively related to percentage of walking allocated to recreational purposes. While no mediators of area SES-walking associations were identified, several environmental attributes explained the associations of educational attainment with walking. These included signs of crime, presence of stray dogs and physical barriers to walking. Also several environment attributes acted as correlates of the two walking outcomes.

Conclusions:

Educational attainment rather than area SES was a key determinant of walking in Hong Kong elders. Only a few environmental characteristics explained SES differences in walking behavior, which indicated that individual and social factors may be more important in this respect within the context of Hong Kong.

S24.3**Physical activity among Hong Kong children with disabilities: Contextual characteristics of special school environments****Authors:**

Cindy HP Sit, Thomas L McKenzie, Ester Cerin, Alison McManus

Purpose:

To document children's physical activity (PA) in both structured and unstructured settings and examine modifiable contextual variables (Study 1); and to determine the impact of innovative electronic game on children's activity levels at school (Study 2).

Methods:

Participants were children with five disability types in 10 special schools (Study 1), and children with mild intellectual disabilities in 3 special schools (Study 2). Children's observed PA was examined using a validated observation tool (SOPARC) in structured (physical education, PE) and unstructured (recess, lunch, and before and after school) settings at school. Contextual characteristics of the activity areas (i.e., accessibility, usability, provision of supervision, organized activities, and equipment) were also assessed.

Results:

Study 1: Children engaged in greater amounts of MVPA in unstructured than structured settings. They were more active during recess and lunch periods than other settings including PE. Areas were generally usable, but frequently less accessible, supervised, or equipped. Children were more active in the activity areas when supervision and organized activities were provided. Study 2: Children did not increase energy expenditure in unstructured settings over baseline, indicating minimal effects of interactive electronic game on children's activity accrual in the open school environments during free play.

Conclusions:

Children's activity accrual is influenced by potentially modifiable contextual characteristics of the school environments. Meanwhile providing limited numbers of interactive electronic games as prompts for PA does not work well in the open school environments. A more sophisticated intervention design might help promote children's active behavior at school.

SYMPOSIA

S25

Environmental determinants of children's physical activity: The IPEN-children study

Moderator: Greet Cardon, Ghent University, Ghent, Belgium

Presenters: Erica Hinckson, Ester Cerin, Sara D'Haese, Orna Baron-Epel, Les McGrath

Discussant: Jo Salmon, Deakin University, Melbourne, Australia

Purpose:

To provide an overview of studies from different countries, investigating the association between the built environment and children's physical activity (=PA), and to discuss these findings.

Rationale:

Recently, the relationship between PA and the built environment in children has gained increasing interest. However, there are still a lot of research gaps and inconsistencies in the current evidence, and the relationship between the built environment and children's PA may vary by country. Therefore, it is important to study this relation and compare the results in different countries. This symposium covers also unique studies from understudied countries (Israel) and age-groups (preschoolers).

Objectives:

(1) To present studies that address environmental determinants of children's PA across 3 different countries, (2) to provide a forum to discuss results with a wider audience, (3) to discuss future directions and application of findings.

Summary:

The chair person will begin the session with an introduction on the rationale, purpose and format of the symposium. Following the 4 presentations, there will be an interactive session where the discussant will first provide an overview of the main issues of the presentations and will facilitate further discussion. Individual speakers will cover four related areas:

- (1) A literature overview, including 22 studies; investigating the relation between the built environment and children's objective MVPA. Residential neighborhoods or activity settings were defined with geographical information systems, global positioning systems or street audits.
- (2) The relation between parental perceived neighborhood environment and objectively measured moderate- to vigorous-physical activity (=MVPA) in preschoolers from Hong Kong; one of the most inactive populations worldwide.
- (3) The association between objective neighborhood walkability and different domains of reported and objective PA in Belgian children; and the potential moderating effect of neighborhood socio-economic status in this relation.
- (4) The relation between the objectively measured built environment (including urban fabric and land use measures) and different domains of active living among children in Israel.

Symposium participants will be exposed to new information regarding environmental factors that determine children's PA.

S25.1

The association between neighborhood socio-economic status, objective walkability and different domains of children's physical activity in Belgium

Authors:

Sara D'Haese, Delfien Van Dyck, Ilse De Bourdeaudhuij, Benedicte Deforche, Greet Cardon

Purpose:

The aim of this study was to investigate the association between objective walkability and different domains of children's PA, and to investigate the moderating effect of neighborhood socio-economic status (SES) in this relation.

Methods:

Data were collected between December 2011 and May 2013 as part of the Belgian Environmental Physical Activity Study in children (BEPAS-child). Children (9-12 years old) and one parent (n=606) were recruited from 18 elementary schools in Ghent (Belgium). Children together with one parent completed the Flemish Physical Activity Questionnaire and wore

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an accelerometer for 7 consecutive days. Children's neighborhood walkability was calculated using geographical information systems.

Results:

In low SES neighborhoods walkability was positively related to walking for transportation during leisure ($\beta=0.370\pm0.102$; 95% CI=0.170 and 0.570) and was negatively related to sports during leisure ($\beta=-0.247\pm0.101$; 95% CI=-0.445 and -0.049). In high SES neighborhoods, walkability was unrelated to children's PA. No other relations between neighborhood walkability and SES, and cycling during leisure, active commuting to school and accelerometer-MVPA were found.

Conclusions:

Living in a high walkable neighborhood can be beneficial for walking for transportation during leisure, but can be detrimental for sports during leisure. No univocal relation between neighborhood walkability and PA was found in 9-12 year old children. Results from international adult walkability studies cannot be generalized to children. There is a need in future research to determine the key environmental correlates of children's PA.

S25.2

The built environment and children's objectively measured moderate-vigorous physical activity: A systematic review

Authors:

Les McGrath, Erica Hinckson, Will Hopkins

Purpose:

Understanding attributes of the built environment that influence children's habitual physical activity can inform urban design. The purpose of this systematic review was to determine the effects of aspects of the built environment on children's objectively measured moderate-vigorous activity (MVPA).

Methods:

Included articles (2000 -2013) assessed associations between children's objectively measured physical activity and residential neighbourhoods or activity settings defined with geographical information systems (GIS), global positioning systems (GPS), or street audits. Of 320 potentially relevant articles, 30 met inclusion criteria, but only 22 (5,048 children, age 8-17 y) provided sufficient data to derive built-environment effects on MVPA.

Results:

In 14 studies with GIS or street-audit measures, availability of neighbourhood green space, recreational facilities and schools had at most small positive effects (~5-30 min) on overall MVPA. Walking tracks had small effects on adolescent girls' activity. Traffic infrastructure had small to moderate negative effects. Adolescents were more active at moderate-vigorous intensity in metropolitan than in suburban and rural districts (56 vs 24 and 23 min per day respectively, a large difference in activity). GPS studies showed that walking to school produced small increases in activity compared with transport by car or bus, greater proportions of activity took place in streets and urban venues (40-80%) than in green spaces (20-50%), and more than half of children's outdoor activity occurred with a parent nearby.

Conclusions:

Availability of outdoor spaces for play, child-safe neighbourhoods for walking, and parental support for outdoor activity are important factors for encouraging habitual activity in children.

S25.3

Built environment and physical activity in Hong Kong pre-schoolers

Author:

Ester Cerin

Purpose:

Hong Kong children have been identified as one of the most inactive populations worldwide. Attributes of the neigh-

neighbourhood environment are thought to be important modifiable factors for increasing pre-schoolers' PA. Thus, the present study aims to identify neighbourhood environmental correlates of PA in Hong Kong pre-schoolers.

Methods:

116 Chinese-speaking parents/primary caregivers and their 3-5 year old pre-schooler were recruited from the Maternal and Child Health Centres (MCHC) of the Department of Health, kindergartens and the community in Hong Kong. Recruitment sites were stratified by area socio-economic status and dwelling density. Parents/caregivers were asked to complete a set of questionnaires (including one on perceived neighbourhood environment) and an activity monitor log for their child. Pre-schoolers' moderate-to-vigorous PA (MVPA) was measured via accelerometers for a week. Participants that had ≥ 4 days of valid accelerometry data (including a weekend day) were included in the analyses.

Results:

Several perceived neighbourhood environmental attributes were associated with MVPA in Hong Kong pre-schoolers. Signs of physical disorder, perceived stranger danger and perceived traffic hazards were negatively related with average daily minutes of MVPA. Perceived traffic safety, availability of outdoor places for play and neighbourhood informal social control were positively associated with daily minutes of MVPA. These effects were not gender specific.

Conclusions:

Safety attributes of the neighbourhood environment and availability of outdoor places to play (perceived by parents) are important correlates of PA in Hong Kong pre-schoolers. Environmental interventions aimed at addressing these issues would likely result in increased levels of PA in Hong Kong pre-schoolers.

S25.4

The relationship between the built environment and active living among children

Authors:

Orna Baron-Epel, Mika Moran, Pnina Plaut

Purpose:

This research aimed to examine the associations between detailed measures of the built environment with different domains of active living among children, including: Walking and biking for travel and/or leisure, and outdoors play.

Methods:

This research employs a cross-sectional design, including an environmental sampling approach and school survey. Objective measures of the built environment were obtained through GIS analysis and included urban fabric measures (residential density, built coverage and street connectivity) and land use measures (green open spaces, public facilities and commercial land uses). Data on children's physical activity and psycho-social factors was obtained through a school survey during September 2010 through January 2011. 573 children (age 10-12) from 7 schools participated in the survey.

Results:

60-88% of the children reported walking for various purposes, while only 33-51% reported biking for different purposes. 57% of the children reported playing outdoors. Urban form measures (intersection density, residential density and built coverage) were significantly positively associated with walking and negatively associated with biking. These associations remained significant after controlling for psychosocial factors. No significant associations were found between the built environment and children's outdoors play.

Conclusions:

Urban form measures were found to have stronger influence on children's physical activity than did land-use measures. Children's walking was associated with compact urban form, while children's biking was associated with sprawling urban form. These findings raise the need to draw a more clear distinction between children-related walkability and bikability.

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S26

PA, sedentary and dietary behaviors during the transition from high school to college/university or work place

Moderator: Anna Timperio, Deakin University, Melbourne, Australia

Presenters: Tom Deliens, Delfien Van Dyck, Dorien Simons, Jerica Berge

Discussant: Leslie A Lytle, Gillings School of Global Public Health, Chapel Hill, North Carolina, USA

Purpose:

The purpose of this symposium is to provide an overview of studies conducted in different countries/states/cities investigating (changes in) physical activity, sedentary and dietary behaviors in young adults (18-25y) during the transition period after leaving high school.

Rationale:

Several studies have demonstrated that the transition period from high school to higher education or work place can be a critical period for weight gain. As college/university students or working young adults start a new phase in life and often move to another city to study/work, this change might be accompanied with new and maybe less healthy behaviors.

Objectives:

The main aims of this symposium are: (1) To present studies that investigated changes in physical activity, sedentary and dietary behavior during the transition from high school to college/university or work place, and/or examined correlates of health behavior during this transition period; (2) to provide a forum to discuss findings of these studies and to share experiences; and (3) to discuss implications for further research and practice based on the findings.

Summary:

The presentations in sequence will be:

1. 1st presenter (Brussels, Belgium): "Changes in eating behavior, physical activity and sedentary behavior during the transition from high school to university in Belgian students"
2. 2nd presenter (Ghent, Belgium): "Can changes in psychosocial factors and residency explain the decrease in physical activity during the transition from high school to college or university?"
3. 3rd presenter (Minneapolis, Minnesota, USA): "Associations between Significant Others' Health Behaviors and Young Adults' Healthful Eating, Physical Activity and Weight Status"
4. 4th presenter (Melbourne, Australia): "Psychosocial and environmental moderators of associations between life events and changes in physical activity after leaving school: Findings from the RAP study"

S26.1

Changes in eating behavior, physical activity and sedentary behavior during the transition from high school to university in Belgian students

Authors:

Tom Deliens, Benedicte Deforche, Anke Bossant, Peter Clarys

Purpose:

Several US studies demonstrated that the freshman year at university is a critical period regarding changes in weight related behaviors. Few US studies, and no European studies so far, focused beyond the freshman year or examined changes during the transition from high school to university. Therefore, the purpose of this study was to examine changes in weight related behavior during the transition from high school to university in Belgian students.

Methods:

Using an online questionnaire, eating behavior, physical activity and sedentary behavior were retrospectively assessed in 104 university students at the start of the first academic year, and prospectively after the first and third semester at university.

Results:

Students reported eating less at home but more out-of-doors (at student restaurant or a friend's place) at university in comparison to the last year of high school. After three semesters at university alcohol consumption had increased with 1.4 servings/week. No changes in fruit & vegetable and French fries consumption were found. Physical activity decreased with 121.3 min/week during the transition from high school to the first year of university and another 20.3 min/week over the following academic year. Total sedentary time did not change throughout this transition period.

Conclusions:

The fact that university students eat more out-of-doors than they did in high school might increase the risk of making more unhealthful food choices. Intervention studies may have to focus on environmental as well as individual factors to counter increases in alcohol consumption and decreases in physical activity levels.

S26.2

Can changes in psychosocial factors and residency explain the decrease in physical activity during the transition from high school to college or university?

Authors:

Delfien Van Dyck, Ilse De Bourdeaudhuij, Tom Deliens, Benedicte Deforche

Purpose:

The study aims were to 1) examine changes in psychosocial factors in students during the transition from high school to college/university, 2) examine if changes in psychosocial factors and residency can predict changes in physical activity (PA) and 3) investigate the moderating effects of residency on the relationship between changes in psychosocial factors and changes in PA.

Methods:

In total, 291 Flemish students participated in a longitudinal study, with baseline measurements during the final year of high school and follow-up measurements at the start of second year of college/university. At both time points, participants completed a questionnaire assessing demographics, active transportation, leisure-time sports, psychosocial variables and residency. Repeated Measures MANOVA analyses and multiple moderated hierarchic regression analyses were conducted.

Results:

Modeling, self-efficacy, competition-related benefits, health-related, external and social barriers decreased, while health-related benefits and time-related barriers increased from baseline to follow-up. Decreases in modeling and time-related barriers were associated with a decrease in active transportation (Adjusted $R^2=3.2\%$); residency, decreases in self-efficacy, competition-related benefits and increases in health- and time-related barriers predicted a decrease in leisure-time sports (Adjusted $R^2=29.3\%$). Residency only moderated two associations between psychosocial factors and changes in PA.

Conclusions:

Residency and changes in psychosocial factors were mainly important to explain the decrease in leisure-time sports; other factors (e.g. distance to college/university) are probably more important to explain the decrease in active transportation. Because few interactions were found, similar interventions, focusing on self-efficacy, time-management and increasing perceived benefits may be effective to increase leisure-time sports in all students.

S26.3

Psychosocial and environmental moderators of associations between life events and changes in physical activity after leaving school: Findings from the RAP study

Authors:

Dorien Simons, Michael Rosenberg, Jo Salmon, Matthew Knuiman, Joanna Granich, Benedicte Deforche, Anna Timperio

Purpose:

This study aimed to examine 1) associations between life events and changes in leisure time physical activity (LTPA) after leaving school in young people from rural Western Australia and 2) whether these associations are moderated by psychological and environmental factors.

Methods:

Longitudinal data were used from the Rural Activity Project (RAP). Secondary schools in rural Western Australia were randomly selected and 374 students from Year 12 (50.5% male) completed three annual telephone interviews (T1, T2 and T3). Life events were moving out of home, starting full-time work and starting full-time tertiary education. Potential moderators were enjoyment, self-efficacy, outcome expectations, club membership and social support from family and friends. Mixed model linear regressions were used.

Results:

Repeated measures showed a significant decline in LTPA between all three time points. Those who started full-time education after leaving secondary school had a smaller decline in LTPA at T2 than those who did not. There was a significant interaction between starting full-time work at T2 and club membership. Starting work at T3 interacted with friend support and self-efficacy.

Conclusions:

There is a decline in LTPA after leaving school. Starting full-time education seems to have a protective effect on this decline in the first year after leaving school. Starting full-time work at T2 was associated with a relatively greater decrease in LTPA among those who did not belong to a club at baseline. At T3 it was associated with a relatively greater decrease in LTPA among those who had low friend support and low-self-efficacy.

S26.4**Associations between significant others' health behaviors and young adults' healthful eating, physical activity and weight status****Authors:**

Jerica Berge, Rich MacLehose, Dianne Neumark-Sztainer, Marla Eisenberg, Melissa Laska

Purpose:

Previous research suggests that a committed relationship, or having a "significant other," improves individuals' physical and psychological health. Less is known about how health behaviors of a significant other impact day-to-day health behaviors, such as physical activity and dietary intake patterns, which can contribute to weight and weight change over time. This study examined associations between significant others' health behaviors and young adults' weight status, dietary intake, and physical activity.

Methods:

Data are from Project EAT-III, a population-based cohort study with young adults from diverse ethnic and socioeconomic backgrounds (n = 1212). Logistic regression models, adjusted for sociodemographics and health behaviors five years earlier, were used to estimate predicted probabilities and calculate prevalence differences in participants' BMI and health behaviors.

Results:

Females whose significant others had positive health behaviors (e.g. healthful dietary intake, physical activity), were significantly less likely to be overweight/obese and were more likely to eat ≥ 5 fruits/vegetables per day and engage in ≥ 3.5 hours/week of physical activity, compared to females whose significant others did not have positive health behaviors. Males whose significant others had positive health behaviors were more likely to engage in ≥ 3.5 hours/week of physical activity compared to males whose significant others did not have positive health behaviors.

Conclusions:

Findings suggest the importance of including significant others in research studies in order to more fully understand influences on young adult weight and weight-related behaviors. Additionally, longitudinal studies are needed to identify temporal associations and to assess more in-depth for causal mechanisms.

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S27

Engaging in health behavior change and maintenance: Differing perspectives on self-regulation

Moderator: Marta M Marques, Faculty of Human Kinetics, University of Lisbon, Lisbon, Portugal

Presenters: Greet Cardon, Marta Marques, Heather Patrick

Discussant: Pedro J Teixeira, Faculty of Human Kinetics, University of Lisbon, Lisbon, Portugal

Purpose:

The purpose of this symposium is to provide an overview of three perspectives on self-regulation and to discuss their similarities, differences, and potential for integration.

Rationale:

Behavioral self-regulation is one of the primary aims of interventions and is a core element of many health behavior theories. However, self-regulation has been conceptualized in multiple ways, creating a diffuse evidence base. Perspectives on self-regulation range from practical (e.g., goals, self-regulatory skills) to functional (e.g. ego depletion) to motivational (e.g., self-determination theory). Understanding these various perspectives and potential synergies between them can lead to important advances in creating a more cohesive literature and improved interventions that result in sustained behavioral self-regulation.

Objectives:

The objectives of this symposium are to (1) provide an overview of three different perspectives on self-regulation; (2) describe the evidence for each perspective in diet, physical activity, and/or weight management; and (3) discuss differences and complementarities between these perspectives in promoting long-term self-regulation of health behaviors, using motivation as a unifying theme.

Summary:

The symposium will consist of three presenters from Belgium, Portugal, and the United States. Each presentation will describe a perspective on self-regulation, the evidence for that perspective in health behavior change and maintenance, and directions for future research. First, Dr. Greet Cardon will describe self-regulation through the lens of self-determination theory (SDT). SDT is a leading theory of human motivation that addresses the circumstances under which people come to self-regulate physical activity and weight management. Dr. Cardon will also address non-engagement as a self-regulatory process, an emerging topic in SDT and the broader literature on self-regulation. Second, Dr. Marta Marques will provide an overview of the self-regulatory skills perspective on the adoption and maintenance of health behavior goals. This perspective addresses the importance of developing key skills such as goal planning and self-monitoring in developing and pursuing health behavior change goals. Third, Dr. Heather Patrick will describe the ego depletion perspective of self-regulation, which maintains that self-regulation operates like a muscle that can be strengthened and fatigued. She will also present findings emerging from mindfulness that offers an alternative to the ego depletion model. The session will conclude with a discussion led by Dr. Pedro Teixeira centering on the similarities and differences between these perspectives, the unifying theme of motivation, and implications for interventions.

S27.1

“No way I am doing this!” Understanding reasons to change or ‘not to change’: The self-regulation perspective starting from self-determination theory

Authors:

Jennifer La Guardia, Leen Haerens, Greet Cardon, Nathalie Aelterman, Maarten Vansteenkiste, Bart Soenens

Purpose:

In practice many health care providers, involved with promoting active and healthy lifestyles are concerned with motivating people towards change. This presentation starts from Self-Determination Theory’s conceptualization of self-regulation to try to understand why some people embrace versus resist change. Recent empirical evidence is presented including two studies identifying defiance (reflecting the blunt rejection of or resistance against change) as a possible additional motivational force, apart from a motivation, controlled or autonomous motivation. In a first study, a sample of 519 secondary students (44% boys, M age = 15.76) out of 30 different physical education classes and their teachers

(n=30) filled out validated questionnaires on teachers' controlling behaviors and students' motivational regulations. Defiance was measured with four items (e.g. I had the tendency to rebel against the teacher's requests', $\alpha = .88$). Exploratory factor analyses (EFA) indicated that defiance and a motivation represented distinct motives for non-engagement, which could also be discerned from controlled and autonomous motivation for engagement. Structural equation modeling further revealed that defiance clearly germinated in reaction to a controlling teacher. In a second study, the self-regulation continuum 'not to change' was further refined through EFA on 33 items representing more autonomous versus controlled motives for non-engagement. Self-Determination Theory's self-regulation continuum will be discussed for reasons to change as well as for reasons 'not to change'. The presentation ends with a discussion of practical implications referring to how health care providers might nurture motives to change or perhaps reluctantly drive people to resist or defy change.

S27.2

A self-regulation skills approach to health behavior change

Author:

Marta Marques

Purpose:

A tenet concept in many self-regulation theories is that behavior is a goal-driven process, in which motivational and volitional aspects interact. After forming an intention to change behavior, it is considered that self-regulation skills can increase the likelihood of achieving health-related goals such as physical activity and healthy eating. In this perspective, emphasis is often placed on training individuals in a number of key strategies, such as appropriated goal-setting, planning techniques, appropriate self-monitoring and progress-related feedback. There is a growing body of evidence for the effectiveness of self-regulation skills in translating health intentions into sustained behavior change. For instance, action planning (i.e. specification of what, when, where and how a health-related goal will be implemented) has been shown to reduce the gap between intentions and action. Other research shows that self-monitoring, which serves to focus one's attention on behavior, is an important component of successful self-regulation in weight management. Despite the many benefits of self-regulation skills-based interventions, findings are heterogeneous; self-regulatory skills may be necessary but not sufficient and additional motivational resources may contribute to successful self-regulation of health-related behaviors. This presentation will provide an overview and describe the evidence for a self-regulation skills perspective in physical activity and eating behaviors. Additionally, implications for practice will be discussed.

S27.3

From ego-depletion to mindfulness: Emerging perspectives on self-regulation

Author:

Heather Patrick

Purpose:

A primary focus of self-regulation research has been on when and whether self-regulatory failures are likely to occur. This is particularly important for health behaviors like diet and health outcomes like weight management, where long-term maintenance is key. The strength model of self-regulation has received increasing attention in domains such as eating regulation and weight management. According to this perspective, self-regulatory resources operate much like a muscle, and when the muscle becomes fatigued, self-regulatory failure results. For example, dieters whose resources were depleted ate more tempting foods (e.g., ice cream) than non-dieters. Other research has indicated that when regulatory resources are depleted, people are less likely to consume healthy foods, particularly those with low palatability. Emerging research based on mindfulness has offered an alternative, suggesting that self-regulatory resources become fatigued because the strategies employed involve distracting from rather than attending to motives, desires and cravings that are in conflict with behavior change goals. Distraction and avoidance require substantial regulatory resources. Thus, engaging in mindfulness practices may be one mechanism by which ego-depletion and subsequent self-regulatory failures may be mitigated. For example, participants taught to acknowledge and accept cravings were less likely to binge eat and more likely to lose weight. Other studies have shown that the mechanism by which mindfulness

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approaches operate is by decreasing psychological avoidance and increasing cognitive flexibility for health behavior goals. Additional research is needed to elucidate similarities and differences between the strength model and mindfulness approaches and how they may be leveraged in behavioral interventions.

S28 ***Childhood obesity and prevention science: Examples of universal, selective and indicated intervention programs for 8-12 year old children***

Moderator: Jayne A Fulkerson, University of Minnesota, Minneapolis, MN, USA

Presenters: Jayne Fulkerson, Martha Kubik, Kerri Boutelle

Discussant: Jess Haines, University of Guelph, Ontario, Canada

Purpose:

This symposium will describe, compare and contrast study planning, nutrition and physical activity program components, recruitment, delivery and retention for three existing family-focused obesity intervention programs for 8-12 year old children at different levels of prevention (universal, selective and indicated).

Rationale:

There are unique differences across intervention programs for 8-12 year old youth, depending on risk level for obesity; yet there are similarities as well. By contrasting these three obesity programs at different levels of prevention, this symposium will highlight key prevention principles such as the importance of context and timing within a developmental focus, the need to address human motivation and change processes, use of a team science approach and ethical practices to do no harm when working with vulnerable populations.

Objectives:

- Describe the existing knowledge of the malleable risk and protective factors regarding obesity prevention and treatment with 8-12 year olds.
- Describe, compare and contrast three existing family-focused obesity intervention programs for 8-12 year old youth: 1) HOME Plus, a community-based universal randomized controlled trial (RCT) that promotes healthful home food environments, high quality family meals and snacks and limited screen time; 2) Project SNAPSHOT, a family-focused, school-nurse led after school weight-management RCT that focuses on increasing healthy dietary practices and physical activity levels and decreasing sedentary practices; and 3) GSH-PO, a guided, self-help treatment RCT of pediatric obesity using the traffic light eating plan and stimulus control to promote healthful eating, promotion of physical activity and reduction of sedentary activity.
- Discuss how key prevention principles and content overlap or are unique for addressing childhood obesity with pre-teens at varying levels of risk.

Summary:

In this symposium, three presenters will describe the three trials and a discussant will compare and contrast how the trials at different prevention stages address promoting healthful eating and physical activity considering the developmental stage of 8-12 year olds, and how motivation, family components and team science may differ by obesity (or obesity risk) level. Efficacy, translation and generalizability will also be discussed.

Format:

1) Dr. Jayne Fulkerson (University of Minnesota, USA) will describe HOME Plus, 2) Dr. Martha Y. Kubik (University of Minnesota, USA) will describe Project SNAPSHOT, 3) Dr. Kerri Boutelle (University of California, San Diego, USA) will describe GSH-PO, and 4) Dr. Jess Haines (University of Guelph, Canada) will be the discussant and will compare and contrast the presented research with her family-based obesity prevention research in Canada.

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S28.1

Universal obesity prevention for 8-12 year old children: HOME Plus as an example

Author:

Jayne Fulkerson

Purpose:

To describe the development and implementation of HOME Plus, a family-focused program to reduce childhood obesity by actively promoting healthful snacks and family meals and reducing children's sedentary behavior using a universal prevention approach.

Methods:

One-hundred-sixty 8-12 year old children and their parents were randomly assigned to the HOME Plus intervention program (n=81 families) or attention-only control group (n=79). The HOME Plus program, based on Social Cognitive Theory and a socio-ecological framework, included 10 monthly sessions delivered to families in community settings and five motivational goal-setting phone calls with parents. Session content focused on increasing the frequency of regularly scheduled family meals and reducing children's sedentary behavior, particularly screen time, to promote healthier eating and activity behaviors and prevent obesity. Each session included separate parent and child groups and activities for the whole family.

Results:

Sixty-eight percent of the families (n= 55) attended at least 7 of the 10 sessions. Eighty-four percent of the families (n=68) completed at least 4 of the 5 calls. Satisfaction with sessions was high, with 97% of the parents and 76% of the children reporting satisfaction with the overall program. Varying levels of need, knowledge and support contributed to session noncompliance.

Conclusions:

Universal obesity prevention programs provide a needed public health service given the high levels of obesity prevalence but there are challenges with making a one-size fits all program when parents and children in such programs have varying knowledge and risk levels. These challenges will be discussed.

S28.2

Selective obesity prevention for 8-12 year old children: Project SNAPSHOT (Students, Nurses and Parents Seeking Healthy Options Together) as an example

Author:

Martha Kubik

Purpose:

To describe the design and conceptual framework of Project SNAPSHOT, a school-based, school nurse-led after school obesity prevention program for 8-12 year old children who are overweight or at risk for overweight.

Methods:

This full scale randomized trial will test a novel school-based approach that utilizes school nurses to deliver a multi-component healthy weight management program to children that includes parents and targets key modifiable diet and activity factors known to be successful in changing long-term energy balance. Guided by a social-ecological framework and the Healthy Learner Model for student chronic condition management, the intervention will engage children with a body mass index \geq 75th percentile and target lifestyle practices that contribute to excessive weight gain while promoting family health and improved management by child and parent of the energy balance environment. The 9-month after school program will include: 1) Quarterly parent/child nurse visits delivered in the home; 2) twice monthly child group sessions; 3) five parent group sessions; and 4) collaboration with health care providers and community-based organizations.

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Results:

Challenges and considerations when designing and implementing a school-based program for overweight children will be discussed, including addressing safety concerns, providing a supportive environment for children and families and maximizing the strengths of the school setting as an intervention delivery site while recognizing and minimizing limitations.

Conclusions:

There is an urgent need for effective, acceptable and safe weight management programs for children delivered by skilled health professionals in accessible settings, and programming that is generalizable and sustainable over time.

S28.3

Indicated obesity prevention for 8-12 year old children: GSH-PO as an example

Author:

Kerri Boutelle

Purpose:

To describe the implementation of Guided Self-Help for Pediatric Obesity (GSH-PO), a low-intensity family-based treatment intervention to reduce childhood obesity, based on more intensive behavior therapy models. GSH-PO promotes healthy eating through the use of the traffic light diet, and promotes increased physical activity and decreases in sedentary behaviors, through readings and 20 minute check-ins every other week (12 visits over 5 months) with an interventionist.

Methods:

Fifty overweight or obese 8- to 12-year-old children (85thBMI%-98thBMI%; 62% female, mean age = 10.4y) and their parents (83% female, mean age = 43.1y, 84% married) were randomly assigned to immediate treatment or to delayed treatment.

Results:

Children in the immediate treatment GSH-PO group decreased their BMI significantly more than did the delayed treatment group (BMI group X time = -1.39; $P < .001$). Similar results were found for BMI-z score and percent OW. At the 6-month post-treatment assessment, changes resulting from GSH-PO were maintained for BMI z score and %OW but not BMI (BMI-z time = -0.10, $P < .001$; percent OW time = -4.86, $P < .05$; BMI time = -0/06, NS). One hundred percent of parents liked GSH-PO; 93% of children liked the program. Eighty-three percent of parents would recommend the program to others.

Conclusions:

GSH-PO showed initial efficacy and high acceptability and liking in this sample. Further efficacy and translational studies are needed to determine parameters for dissemination. Challenges in recruiting and treating overweight and obese children and their parents will be discussed.

S29

Leveraging healthy food retail through in-store marketing and other approaches to improve nutrition environments

Moderator: Amy L Yaroch, Gretchen Swanson Center for Nutrition, Omaha, USA

Presenters: Courtney Pinard, Lukar Thornton, Kim Gans

Discussant: Amy L Yaroch, Gretchen Swanson Center for Nutrition, Omaha, USA

Purpose:

Explore current research efforts in the continually emerging field of healthy food retail using in-store marketing and other approaches to ultimately improve nutrition environments. The 4 P's of marketing - product, price, promotion, and placement will be used as an overarching framework to structure the presentations and discussion for this session.

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Rationale:

“Food deserts” are defined as a geographic area, particularly lower-income neighborhoods and communities, where access to affordable, quality, and nutritious foods is limited. However, the “if you build it, they will come” approach of simply bringing new food outlets with healthier food options into lower-income neighborhoods and communities will probably not prevent and/or reverse obesity if it is done in a isolated fashion. Instead, integrative efforts are needed to actively promote and market healthier food and beverage options by making them more affordable, attractive, culturally relevant, and accessible to all populations.

Objectives:

- (1) To provide attendees an opportunity to learn about current research and trends on innovative healthy food retail through a public health lens across multiple settings.
- (2) To understand how to leverage healthy food retail best practices for promotion of more healthful diets across a variety of communities, geographic jurisdictions, and populations.
- (3) To identify key measurement and research gaps and discuss future directions for the implementation of healthy food retail and in-store marketing strategies across the 4 P's of marketing.

Summary:

Future work in the area of healthy food retail should continue building upon the best practices and also address gaps in measurement with the goal of improving interventions and measures across this topic area. Public health professionals should consider strategies to partner with the food industry to create mutually beneficial interventions to help prevent and/or reverse obesity across multiple populations.

S29.1

Assessing the food system environment across multiple settings

Authors:

Courtney Pinard, Hollyanne Fricke, C. Tracy Orleans, Amy Yaroch

Purpose:

The Robert Wood Johnson Foundation (RWJF) has made diverse investments to investigate the area of healthy food retail. Specifically, RWJF commissioned the Gretchen Swanson Center for Nutrition to conduct a review of 23 programs they have funded in this area. The purpose was to identify best practices and key efforts specific to healthy food retail using in-store marketing and other strategies to promote healthier food choices.

Methods:

A brief email survey and key informant interviews were conducted with leaders from 23 of RWJF's funded programs in the area of healthy food retail/in-store marketing.

Results:

Respondents discussed best practices such as promoting “better-for-you” or healthier foods (e.g., front-of-package labeling, healthy checkout aisles, working with in-store dietitians, and co-tenanting with health centers). Other strategies included: Limiting the marketing of unhealthy foods, potential collaboration with industry, and how supermarkets and other retail outlets could be redesigned to better promote healthier options. Measurement gaps were also identified, specifically that inventories (such as NEMS) have been the most utilized to assess the nutrition environment. However, it is evident that more measures are needed to better capture different aspects of the food retail environment.

Conclusions:

Across the 23 RWJF-funded programs in the area of healthy food retail, there was a wide variety in the level of inclusion of in-store marketing strategies. However, given that this is a burgeoning area, some best practices have been identified, as well as future research directions, which will be discussed during this session.

S29.2

Food marketing strategies in Australian supermarkets

Authors:

Lukar Thornton, Kylie Ball

Purpose:

Supermarkets in Australia are the main source of food purchased for households; however our understanding of how supermarket in-store marketing and pricing strategies impact on purchasing decisions remains limited. This study will present an overview of marketing strategies used by Australian supermarkets and present data on the impact on a price reduction intervention.

Methods:

Audits of in-store environments were conducted and supplemented with additional review material on key marketing strategies currently used by Australian chain supermarkets. Conducted in partnership with one of the leading supermarkets chains, an in-store intervention was undertaken inclusive of price reductions on fruit/vegetables and low-calorie soft drinks/water with the aim of increasing the purchase of these items.

Results:

Relative to healthy food items, the promotion of unhealthy food items dominate the current Australian supermarket environment. Price reductions increased the purchasing of fruits and vegetables but had no impact on beverage consumption.

Conclusions:

Whilst supermarkets provide opportunities to purchase both healthy and unhealthy foods, this study demonstrates in regards to the four P's of marketing (product, price, promotion, and placement) Australian supermarkets tend to more heavily market unhealthy food options. An intervention that changed one of these P's (price) demonstrated that changes to the in-store environment may positively impact on the consumption of healthy foods. Further work is needed to modify aspects of the in-store environment that are geared towards the promotion of unhealthy food items.

S29.3

Fresh to You: An innovative, public-private partnership to increase fruit and vegetable (F&V) consumption: Effectiveness lessons learned and future directions

Authors:

Kim Gans, Gemma Gorham

Purpose:

Fresh to You (FTY), a public-private partnership between F&V distributors, Brown University and RI Department of Health was created to address barriers of low-income consumers to eating F&V (cost, limited availability and limited time to shop). A F&V distributor provided high-quality F&V directly to community-based organizations (CBO) at discounted prices. FTY was implemented in 6 CBOs serving low-income families to evaluate feasibility and effectiveness.

Methods:

F&V Markets were held regularly at each CBO. Market participants with children aged 3-13 (n=487) were enrolled in a cohort effectiveness study. Baseline and five-month follow-up surveys were conducted with parents. Change scores of F&V intake were calculated and tested for significance applying paired t-tests for adults and children.

Results:

Participants were 91.5% female, 59% Hispanic; 52% born outside the US; 49% on food stamps; 45% household income < \$20K per year. The greatest barrier to eating more F&V was cost. F&V prices averaged 15-25% below supermarket prices. Most popular items included bananas, mangoes, grapes, tomatoes, broccoli, asparagus and tomatoes. FV intake of 3-13 year old children increased by 0.51 cups, (P = 0.0001) but parents' intake did not change over time.

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Conclusions:

The FTY program is an example of a successful healthy food retail intervention. The project did have some implementation challenges and lessons learned with regard to the 4 P's of product, promotion, placement and price. In addition, we will address relevant current research and future directions of the FTY including new ideas related to the marketing mix.

S30

The IPEN adult study - 12-country study on the relationship between the physical environment, physical activity and weight outcomes

Moderator: Delfien Van Dyck, Ghent University, Ghent, Belgium

Presenters: Jacqueline Kerr, Ilse De Bourdeaudhuij, Ester Cerin, Delfien Van Dyck

Discussant: James F Sallis, University of California, San Diego, USA

Purpose:

To give an overview of the first complete results of the IPEN Adult study, an international study examining the relationship between the physical environment and health outcomes (mainly physical activity and weight outcomes) using a comparable study protocol in 12 culturally- and environmentally diverse countries worldwide. Furthermore, a strong focus will be put on discussing the policy implications of the study results.

Rationale:

The IPEN Adult study started in 2009, and now the first complete results, combining data of all 12 countries are available. Results of single-country studies probably underestimate the true strength of the associations between the physical environment and physical activity/weight outcomes because of a limited within-country variation in both environmental characteristics and behaviors. Therefore, this international study, pooling data of 12 countries worldwide was absolutely needed in order to estimate the true strength of the above mentioned associations. Furthermore, to inform policy makers, urban planners and practitioners on how the physical environment should be developed in order to encourage an active lifestyle, concrete results of large-scale international studies are needed.

Objectives:

- To give an overview of the first complete results of the IPEN Adult study, pooling data from 12 environmentally- and culturally-diverse countries
- To estimate the strength, direction and shape of associations between the perceived physical environment, physical activity and weight outcomes, as well as possible moderating effects of study site and gender.
- To estimate the strength, direction and shape of the relationship between accelerometer-based physical activity, sedentary time and weight outcomes, and identify possible country- or gender-specific findings.
- To discuss the policy implications of the IPEN results.

Summary:

The symposium chair will briefly introduce the IPEN Adult study. Then 4 presenters will each present complete results of this international 12-country study. Jacqueline Kerr will focus on the relationship between the perceived environment and active transportation, Ester Cerin on the associations with accelerometer-based physical activity. Ilse De Bourdeaudhuij will present the findings on the relationship between the physical environment and BMI. Delfien Van Dyck will focus on the associations between accelerometer-based physical activity and weight outcomes. After these presentations, James F Sallis will lead the general discussion, with specific attention for possible policy implications of IPEN.

SYMPOSIA

S30.1

International study of objectively-measured physical activity and sedentary time with body mass index and obesity: IPEN Adult study

Authors:

Delfien Van Dyck, Ester Cerin, Ilse De Bourdeaudhuij, Erica Hinckson, Rodrigo S Reis, Rachel Davey, Kelli L Cain, James F Sallis

Purpose:

To examine the strength, direction and shape of dose-response associations of accelerometer-based PA and sedentary time with BMI and weight status in 10 countries worldwide, as well as the moderating effects of study site and gender.

Methods:

Data from the International Physical activity and the Environment Network (IPEN) Adult study were used. IPEN Adult is an observational multi-country cross-sectional study, and 12 sites in 10 countries were included. Participants wore an accelerometer for seven consecutive days, completed a socio-demographic questionnaire and reported height and weight. In total, 5712 adults (18-65 years) were included in the analyses. Generalized additive mixed models, conducted in R, were used to estimate the strength and shape of the associations.

Results:

A curvilinear relationship of accelerometer-based moderate-to-vigorous PA and total counts/minute with BMI and the probability of being overweight/obese was identified. The associations were negative, but weakened at higher levels of moderate-to-vigorous PA (>50 min/day) and higher counts/minute. No associations between sedentary time and weight outcomes were found. Complex site- and gender-specific findings were revealed for BMI, but not for weight status.

Conclusions:

Based on these results, the current Institute of Medicine recommendation of 60 minutes/day of moderate-to-vigorous PA to prevent weight gain in normal-weight adults was supported. Somewhat unexpected, no relationship between sedentary time and the weight outcomes was present, calling for further examination. If moderator findings are confirmed, it may be the case that the relationship between PA and BMI is country- and gender-dependent, which could have important implications for country-specific health guidelines.

S30.2

Perceived neighborhood environmental attributes associated with adults' walking and bicycling for transport: Findings from a 12-country study

Authors:

Jacqueline Kerr, Loki Natarajan, Jordan Carlson, Jen Emond, Hannah Badland, Olga Lucia Sarmiento, Rodrigo S Reis, Ester Cerin

Purpose:

To understand which built environment perceptions correlate with walking and bicycling for transport, and to examine the strength and shape of these relationships across diverse cities and countries.

Methods:

Common study methods were performed across 17 cities in 12 countries. Participants were selected from neighborhoods that varied in walkability and where possible income. Nine scales from the Neighborhood Environment Walkability Scale assessed the perceived environment. The IPAQ long measured transportation walking and bicycling. Outcomes included any walking/bicycling, 150+ minutes per week of walking/bicycling and total minutes walking/bicycling in those who walked/biked. GAMMS analyses were employed to assess the shape and strength of relationships and investigate city interactions.

Results:

Percentages of the 13,745 participants reporting any walking ranged from 52-92%, any bicycling from 1-63%, meeting

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walking guidelines from 14-62%, and 150+ minutes bicycling 0-29%. Total minutes walking ranged from 79 to 402 and total minutes bicycling ranged from 1- 136. Stores and transit stops within easy access, street connectivity, infrastructure safety (street lights, crossings and sidewalks), aesthetics, and local destinations were related to any walking or bicycling for transport and walking or bicycling for transport > 150 minutes a week. Safety was negatively related to outcomes. Some cities presented stronger relationships than others and in some cities the results were not in the expected direction.

Conclusions:

Our study found more consistent environmental predictors for both bicycling and walking for transportation than previous studies suggesting that built environment interventions might impact both behaviors in a “two for one” manner.

S30.3

Association between perceived neighbourhood environmental attributes and body mass index: A 12 country study

Authors:

Ilse De Bourdeaudhuij, Delfien Van Dyck, Deborah Salvo, Grant Schofield, Olga Lucia Sarmiento, Josef Mitas, James F Sallis, Ester Cerin

Purpose:

The overall purpose of this study was to examine the strength, direction and shape of the associations between perceived neighbourhood built environmental attributes and BMI. Variation of the associations by study site as well as the interactions with neighbourhood-level socioeconomic status (SES) were also explored.

Methods:

Pooled data from the 12 participating countries (5 continents) of the International Physical Activity Environment Network (IPEN) study were used. Similar measures and protocols were executed in all study sites. Perceived neighbourhood built environmental attributes were measured with the NEWS questionnaire, BMI was assessed by self-reporting height and weight in eight countries and by objective data using standardised techniques in four countries.

Results:

In general, only few environmental attributes were predictive of weight status or BMI over and above the socio-demographic characteristics. Safety from traffic was the only environmental attribute that was predictive of both a better weight status (less overweight/obese), and a lower BMI. For the continuous BMI variable, higher land use mix diversity and perceived safety from crime (curvilinear) were additionally related with lower BMI.

Conclusions:

The closer the perceived walking proximity to nine categories of common destinations, and the safer it is to reach these destinations (no heavy traffic along nearby streets, slow traffic speed, speeding drivers), the lower the body mass of the inhabitants of the urban and suburban regions across the world. Moreover, in neighbourhoods with very low perceived crime safety, a small increase in crime safety could possibly lead to a strong decrease in BMI.

S30.4

Associations of adults' perceived neighborhood environment with objectively-measured physical activity in 11 countries: The IPEN Adult study

Authors:

Ester Cerin, Kelli L Cain, Terry L Conway, Delfien Van Dyck, Erica Hinckson, Jasper Schipperijn, Ilse De Bourdeaudhuij, James F Sallis

Purpose:

Environmental changes have been identified as potentially effective population-level physical activity (PA) promotion strategies. However, good quality multi-site evidence to guide international action aimed at developing activity-supportive environments is lacking. We estimated pooled associations of perceived environmental attributes with objectively-measured PA outcomes; between-site differences in such associations; and, the extent to which perceived environmental attributes explain between-site differences in PA.

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Methods:

This was a cross-sectional study conducted in 16 cities located: Belgium, Brazil, Colombia, Czech Republic, Denmark, China, Mexico, New Zealand, Spain, United Kingdom, and USA. Study participants were 6,968 adults residing in administrative units stratified by socio-economic status and transport-related walkability. Predictors were 10 perceived neighborhood environmental attributes. Outcome measures were accelerometry-assessed average weekly minutes of moderate-to-vigorous PA (MVPA) and meeting the PA guidelines for cancer/weight gain prevention (420 min/week of MVPA).

Results:

Most perceived neighborhood attributes were positively associated with the two PA outcomes in single-predictor models. Associations were generalizable across geographical locations. Aesthetics and land use mix - access were significant predictors of both PA outcomes in the fully-adjusted models. All perceived neighborhood attributes were associated, in the expected direction, with between-site differences in the total effects of the perceived environment on PA outcomes.

Conclusions:

Residents' perceptions of attributes of their neighborhood environment that facilitate walking were positively associated with objectively-measured MVPA and meeting the guidelines for cancer/weight gain prevention at the within- and between-site levels. Associations were similar across study sites, supporting international recommendations for designing built environments that facilitate PA.

S31

Family-based interventions to improve physical activity levels in children and adolescents: Lessons learned

Moderator: Helen Elizabeth Brown, University of Cambridge, Cambridge, UK

Presenters: Kirsten Davison, Phillip Morgan, Ryan Rhodes, Sandy Bailey

Discussant: Tom Baranowski, Baylor College of Medicine, Texas, USA

Purpose:

This symposium aims to explore family-based interventions to improve physical activity levels in children and adolescents, with speakers reporting on their experiences from recently conducted studies.

Rationale:

Despite the well-established relationship between physical activity and health, the majority of children are insufficiently active, and levels decline substantially into adolescence. Recent observational data indicate that this decline in activity may be most evident outside of the school environment. Engaging with the family may be a promising strategy, and may support the maintenance of sufficient physical activity levels (and perhaps concurrently avoid an increase in sedentary behavior) at the critical juncture before children progress to secondary school, but is a relatively under-studied area. Our speakers will report on innovative approaches to engaging the family, drawn from recently conducted interventions in children from pre-school to early adolescence, reflecting upon recruitment and retention of participants, and strategies to improve physical activity levels in children. Given the personal evaluation offered by our speakers, this symposium will be of interest to a range of attendees of the ISBNPA meeting; those conducting intervention research, and those working in policy and practice. The session will also benefit from the considerable experience of our discussants, who will consolidate material from the presentations, and discuss theoretical and methodological considerations for future studies.

Objectives:

This symposium will aim to:

1. Offer insight into the experiences of intervention specialists, who will reflect on lessons learned and share recommendations for future directions
2. Inspire those attending to move forward with intervention design, further increasing our efforts to improve physical activity levels in children and adolescents
3. Evoke discussion, with a view to opening dialogue between those conducting similar research and encouraging future collaboration

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Summary:

The symposium will feature four presentations of ten minutes each, with an additional five minutes allocated for clarifying questions:

- Professor Kirsten Davison (Harvard University, USA)
- Professor Phillip Morgan (The University of Newcastle, Australia)
- Professor Ryan Rhodes (University of Victoria, Canada)
- Professor Sandy Bailey (Montana State University, USA)

The discussants, Professor Tom Baranowski (Baylor College of Medicine, USA), and Lynda Ransdell (Montana State University, USA) will then comment on the presented family-based interventions in light of relevant theory, measurement and comparative efficacy issues, and lead audience discussion.

S31.1

4-Health: Results of an educational program promoting healthy lifestyles in rural families

Authors:

Sandra Bailey, Wes Lynch, Carrie Benke, Galen Eldridge, Jill Martz, Lynn Paul

Purpose:

4-Health is a multi-disciplinary educational outreach project that promotes healthy lifestyles for rural families through an interactive program for parents of 8-12 year-olds. The main goal of the program is to change the behaviors of parents to promote health while preventing or reducing the risk of obesity.

Methods:

Experimental participants (N=76) attended 10, ninety-minute sessions on the topics of food and nutrition, physical activity, positive body image, and effective parenting and family communication. Program participants work directly with their 4-Health child and the remainder of their family using take-home materials and activities. A two-group repeated measures design was used to determine the effectiveness of the 4-Health program. The control group (N=74) received written information that corresponded to the class topics. A variety of attitudinal, physiological, and behavioral assessments in the areas of food and nutrition, physical activity, family communication, and body image behaviors and attitudes were conducted.

Results:

There was a significant increase in physical activity and reduction in sedentary time from pre- to posttest; however, there were no between group differences - both the experimental and control groups increased activity and reduced sedentary time.

Conclusions:

The lack of difference between groups may be related to the sample; these families may be more motivated initially and even those who were in the control group reported that they had read the material mailed to them. Using a no-treatment control group may be beneficial in documenting differences in the future.

S31.2

Physical activity outcomes from the 'Healthy Dads, Healthy Kids' community randomized controlled trial: A community-based healthy lifestyle program for fathers and their children

Authors:

Philip Morgan, Clare Collins, Ronald Plotnikoff, Robin Callister, Anthony Okely, Myles Young, Adam Lloyd, David Lubans

Purpose:

The translation of efficacious inter-generational obesity prevention programs into evidence-based community programs is a research and public health priority. The primary aim of this study was to evaluate the impact of the 'Healthy Dads, Healthy Kids (HDHK)' program when delivered by trained facilitators in community settings on physical activity outcomes for fathers and children.

Methods:

A two-arm randomized controlled trial of 93 overweight/obese fathers (mean[sd] age=40.3[5.3] years; BMI=32.5[3.8] kg/m²) and their primary school-aged child(ren) (n=132) from the Hunter Region, Australia. Families were randomized to either: (i) HDHK intervention or (ii) wait-list control group. The 7-week intervention included seven sessions (3 with dads/kids). The physical activity sessions focused on fundamental movement skills, rough and tumble play, health-related fitness, and fun household/backyard games. Assessments were held at baseline and 14-weeks for fathers and children and included objectively measured physical activity (7 days pedometry), weight (kg), waist, BMI, blood pressure and resting heart rate.

Results:

Generalized linear mixed models (intention-to-treat) demonstrated significant between-group differences for fathers' (1258 steps; 95%CI 56, 2459) ($P=0.04$; $d=0.46$) and children's physical activity (1625 steps; 95%CI 418, 2832) ($P=0.01$; $d=0.50$). Significant intervention effects were also found for children's BMI z-score ($d=0.10$) and father's weight ($d=0.24$), waist ($d=0.41$) and resting heart rate ($d=0.59$).

Conclusions:

The innovative aspect of HDHK was that fathers and children were both targeted as agents of behavior change. HDHK significantly improved physical activity levels and other health outcomes in fathers and children, providing evidence for program effectiveness when delivered in a community setting by trained facilitators.

S31.3

Stationary cycling exergame use among children and their parents across 12 weeks in the family home: A randomized controlled trial

Authors:

Ryan Rhodes, Chris Blanchard, Shannon Bredin, Mark Beauchamp, Ralph Maddison, Darren Warburton

Purpose:

The primary objective of this study was to evaluate the effect of an exergame bike in comparison to a stationary bike in front of a TV across three-months within a family home environment. It was hypothesized that the exergame condition would result in greater use for both children and their parents.

Methods:

Forty-two inactive families were randomized to either of the two conditions, and recorded weekly bike use in a log book. Thirty-two participating families completed the three-month trial (n=16 exergame; n=16 standard).

Results:

Participating children were 61% male and 11.64 years of age ($SD=1.43$). In intention to treat analyses, exergame children had significantly ($t=1.95$, $p<.05$; $d=.89$) more bike use on week 1 than standard condition children but there was no difference between groups across the first six weeks ($p>.05$; $d=.06$) or from seven to 12 weeks ($p>.05$; $d=.19$). There were no significant differences between the bike conditions for parents ($p>.05$).

Conclusions:

Overall, the addition of a stationary bike resulted in diminishing minutes of use per week in exergame (22 min per week 0-6 weeks; 11 min per week 7-12 weeks) and standard form (20 min per week 0-6 weeks; 8 min per week 7-12 weeks). The exergame had a high use period over the first week among children ($M=55$ min) in comparison to the standard bike ($M=22$ min), but the effect diminished quickly across time. Innovative solutions to sustain this initial high level of use and engage the family is needed in future research efforts.

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S32

Sugar sweetened beverages, obesity and related metabolic diseases in children

Moderator: Jaimie N Davis, University of Texas at Austin, Austin, TX, USA

Presenters: Britt Jensen, Virginia Chomitz, Michael Goran

Purpose:

Pediatric obesity is a growing public health problem and minority youth are disproportionately affected by this epidemic. Pediatric obesity is a major contributor to many other types of diseases, including cardiovascular disease, metabolic syndrome, type 2 diabetes, and nonalcoholic fatty liver disease (NAFLD). There is strong evidence to support that intake of sugar sweetened beverages (SSBs; including sodas, fruit drinks, sports drinks) is a leading culprit in the pediatric obesity epidemic. There is also growing evidence to support that SSB plays a role in related metabolic disorders in youth. However, only a few interventions have been conducted that specifically target reductions in SSBs on obesity outcomes, and even fewer examine the impact on metabolic parameters.

Rationale:

Researchers and public health advocates need to understand how interventions targeting reductions in SSB can potentially decrease childhood obesity and related metabolic disorders.

Objectives:

This symposium will focus on the following: 1) An overview of global SSB consumption patterns and a comprehensive review of cross-sectional research studies that have examined the link between SSB and other types of beverages (such as flavored milks and 100% juice intake) on obesity prevalence and other adiposity measures in children (from birth to young adulthood); 2) longitudinal findings of how SSB is linked to weight gain in children; 3) a review of interventions that target SSB reduction on obesity outcomes; 4) assessment of how sugar/fructose reduction impacts metabolic health in children.

Summary:

Decreasing availability and consumption of SSBs has the potential to have profound effects on reducing obesity and related metabolic diseases in pediatric populations.

S32.1

Childhood obesity - What are kids really drinking today?

Author:

Jaimie Davis

Purpose:

The goals are: 1) To discuss global trends in added sugar, sugar sweetened beverage (SSB), and high fructose corn syrup intake in children, ranging in age from birth to 18 years, and representing different ethnic/racial and income groups; 2) To give an overview of how SSB intake impacts obesity/adiposity in youth; and 3) To discuss the role that other beverages, such as flavored milk and 100% juice, play in the pediatric obesity epidemic.

Methods:

To conduct a comprehensive review of cross-sectional epidemiological pediatric studies that has examined national and international trends in added sugar and SSB intake in children, and those that have examined the relationship of SSB and other beverages on obesity prevalence and other markers of adiposity.

Results:

SSB intake contributes up to 50% of added sugar intake in all children (2-18 y), with minority and low-income groups having the highest intake. Numerous studies have shown a strong link between SSB and obesity prevalence and other measures of adiposity, such as waist circumference, visceral fat, and body fat percentage. The data on flavored milk and 100% juice intake is somewhat controversial, with some studies showing a positive link to obesity prevalence, while others show no relationship.

Conclusions:

Evidence linking SSB intake to obesity and adiposity in children is strong, while more research is warranted to understand the effects that flavored milk and 100% juice intake play in pediatric obesity. Developing and testing the effects of randomized controlled interventions targeting SSB reductions on childhood obesity parameters is warranted.

S32.2**Association between sweet drink intake and adiposity: Results from Danish children participating in a long-term intervention study****Authors:**

Britt Wang Jensen, Birgit Maria Nielsen, Ida Husby, Anna Bugge, Bianca El-Naaman, Lars Bo Andersen, Ellen Trolle, Berit Lilienthal Heitmann

Purpose:

Several previous studies report a direct association between sugar-sweetened beverages and adiposity among children, however, the role of sugar-sweetened beverages in the obesity epidemic is still debatable. The purpose of this presentation is to present the results of a Danish study examining the association between total sweet drink intake among children and body mass index (BMI) and skin fold thickness the following 3-7y in the context of results from other literature.

Methods:

The study was based on the Copenhagen School Child Intervention Study; a 7y longitudinal study initiated in 2001 among preschool children aged 6y. Weight, height and skinfold thickness were measured in 366 children at enrolment and 3 and 7y later. Physical activity (4-days accelerometer) and dietary intake (7-day food record) were assessed at age 6 and 9y.

Results:

The total intake of sweet drinks at age 6y was not associated with change in BMI or skinfold thickness from age 6-9y or 6-13y. Change in intake of sweet drinks from age 6-9y was also not associated with change in BMI or skinfold thickness from age 9-13y. The intake of sweet drinks at age 9y was weakly associated with change in skinfold thickness from 9-13y (per 100g) (β : 0.014, 95% confidence interval: -0.001 to 0.029, $p=0.06$) but not with change in BMI.

Conclusions:

We found little evidence for an association between sweet drink intake and adiposity among the children included in the present study. This presentation will discuss our results in the context of results from previous studies.

S32.3**Interventions that target sugar sweetened beverage reduction on obesity outcomes****Author:**

Virginia Rall Chomitz

Purpose:

The goals are to 1) provide an overview of the types of interventions designed to reduce sugar sweetened beverages (SSB) and the SSB behavior- and obesity-related outcomes that have been achieved, 2) provide a detailed description of a randomized controlled trial (RCT) that assessed the effect on weight gain of an intervention designed to reduce SSB consumption among adolescents, and 3) reflect on future SSB intervention research needs.

Methods:

Results from relevant SSB intervention studies are summarized according to the social ecological model (SEM) to provide background on the types of studies that have been conducted and their key results. Specifically, we review a multi-component RCT intervention that provided motivational counseling and non-caloric beverages at home to overweight and obese adolescents.

Results:

The relatively few intervention studies designed to reduce SSB consumption and impact children's obesity include efforts at multiple levels of the SEM. Different strategies, including increasing knowledge and self-efficacy, and decreasing the availability of SSB through policies, pricing, and practices have been deployed. Results from the featured RCT include significant between group differences in SSB consumption ($-.7 \pm 0.1$ servings per day) and changes in Body Mass Index (BMI) ($-.57 \pm 0.28$) at one year, with evidence of effect modification according to ethnic group. Between group difference in BMI change was not significant at two years.

Conclusions:

Among overweight and obese adolescents in the multi-component SSB intervention group, increase in BMI was smaller and SSB consumption was significantly reduced. More robust research is warranted to better understand effectiveness of different strategies.

S32.4**How growing up sweet can turn sour****Author:**

Michael I. Goran

Purpose:

This talk will review the metabolic basis explaining the links between dietary sugar, obesity and metabolic risk, with a particular focus on effects in children and infants.

Methods/Results: We will review aspects of sugar metabolism relative to obesity pathways and resulting risk for type 2 diabetes, cardiovascular disease and fatty liver disease through effects of sugars on insulin action, lipid parameters and inflammatory pathways. Aspects related to the major differences between glucose, fructose and sucrose metabolism will be highlighted with particular emphasis on how fructose metabolism is especially problematic for infants and children when fat mass is rapidly expanding and when pathways relating to energy balance homeostasis are being developed. This will include a review of intervention/feeding studies in humans and animals as well as covering basic aspects of intermediary metabolism relevant to sugars.

Conclusions:

Despite strong evidence for the role of dietary sugar in obesity and emerging evidence for the role of fructose in promoting obesity and metabolic dysfunction in early life, there is a major gap in the area of human studies. Thus future studies are warranted, particularly in high-risk pediatric populations and during critical developmental periods such as during pregnancy and during infancy when major changes occur in nutritional and metabolic development.

S33***Energy balance related behaviors in preschool children***

Moderator: Greet Cardon, Ghent University, Ghent, Belgium

Presenters: Kylie Hesketh, Greet Cardon

Discussant: Dianne Ward, University of North Carolina, USA

Purpose:

To provide study findings from different countries, on energy-balance related behaviors (EBRB's) in preschool children and to discuss these findings.

Rationale:

While the prevention of overweight at young age is of public health interest, the evidence base for effective obesity prevention programs in preschool-aged children is still emerging, and more information is required in order to better inform intervention efforts. This symposium covers data on EBRB's in this young age group, looks at the interplay of the different EBRB's and explains the associations with weight status at preschool age.

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Objectives:

(1) To present studies that address EBRB's, including interplay of the behaviors and associations with weight status, (2) to present the ToyBox program and the InFANT program, two innovative prevention programs for preschool aged children (3) to provide a forum to discuss results with a wider audience, (3) to discuss future directions and application of the findings.

Summary:

The chair person will begin the session with an introduction on the rationale, purpose and format of the symposium. Then there will be 3 presentations:

- (1) The interplay of energy-related behaviors in explaining screen-time in preschool children: The Melbourne InFANT Program
- (2) Fluid intake from beverages of preschool children and associations with SES and ethnicity of the parents: The ToyBox-Study
- (3) Energy balance related behaviors among non-overweight and overweight preschoolers in Europe: The ToyBox-study.

Following the 3 presentations, there will be an extensive interactive session where two discussants will first provide an overview of the main issues of the presentations and will facilitate further discussion. One discussant (Dianne Ward) will mainly focus on nutrition, while a second discussant (Trina Hinkley) will focus on physical activity and sedentary behavior. The final discussion will focus on all EBRB's and their interplay and importance in the scope of prevention efforts.

Symposium participants will be exposed to new information regarding EBRB's in preschoolers and to prevention programs.

S33.1

Screen-time in preschool children from the Melbourne InFANT program: Associations with other early life energy-related behaviors

Authors:

Kylie Hesketh, Jo Salmon, Sarah McNaughton, David Crawford, Karen Campbell

Purpose:

Preschoolers engage in more screen-time than recommended, yet associations with other energy-balance related behaviors (EBRB) is unknown.

Methods:

Data were from 181 control participants in the cluster-randomised controlled Melbourne Infant Feeding, Activity and Nutrition Trial (InFANT) Program. Daily television, computer game, and hand-held e-game use were assessed by parent-report at child age 3.5yrs and summed to provide daily screen-time. Other EBRBs assessed at 9 and 18mths and at 3.5yrs included physical activity (accelerometry; not assessed at 9mths) and outdoor time (parent-report), fruit, vegetable, sweet snack and savoury snack intake (3x24hr diet recall) and zBMI (measured). Associations were assessed using linear regression with bootstrapping and controlling for clustering.

Results:

With only ~25% of children reported to use hand-held e-games and 5% computer games, these outcomes were not considered separately. Boys and girls spent an average of 118 and 117min/day, respectively, watching television and 134 and 122min/day in total screen-time with no significant sex differences. Cross-sectional associations with television viewing were shown for outdoor time ($B=0.29$, 95% CI: 0.03, 0.54) at 3.5 years of age. This association was maintained in the multivariable model ($B=0.43$, 95% CI: 0.13, 0.73) and observed in the multivariable model for total screen-time also ($B=0.52$, 95% CI: 0.18, 0.85). Television viewing (positive) and fruit intake (negative) at earlier ages showed longitudinal associations with preschoolers' television viewing and screen-time.

Conclusions:

Findings indicate some clustering of EBRBs and point to potential early life indicators of individuals at risk of high preschool screen-time.

S33.2

Energy balance-related behaviors among non-overweight and overweight preschoolers in Europe: The ToyBox-study

Authors:

Greet Cardon, Marieke De Craemer, Violeta Iotova, Piotr Socha, Berthold Koletzko, Luis Moreno, Yannis Manios, Ilse De Bourdeaudhuij

Purpose:

To study a wide range of EBRB's and weight-status in a large European sample of preschoolers.

Methods:

Participants were part of a cross-sectional survey within the ToyBox-study, which aims at preventing overweight in 4-to 6-year old children, by developing a multidisciplinary intervention and testing it in six European countries. Baseline data were collected between March and July 2012 according to standardized protocols: Height and weight were measured, parents filled in questionnaires and children wore a pedometer for 5 consecutive days. Logistic regressions were used to assess if the following EBRB's were associated with overweight: Taking <13,000 steps/day, not being a member of a sports club, not commuting actively to preschool, spending limited time outside, watching TV, using a computer or quiet play for >1hour/day, sleeping <10 hours, not drinking water daily, soft drink consumption >1 time/week, eating fruit and vegetables as a snack <1 time/week, often watching TV during dinner, skipping breakfast regularly.

Results:

14% of the boys (n= 4,187) and 16 % (n=3,904) of the girls were overweight/obese. Boys "taking <13,000 steps on weekend days" were more likely to be overweight/obese, while in girls the following behaviors were found to increase the likelihood of being overweight/obese: Sleeping <10 hours, not being a member in a sports club, >1h/d quiet play on weekdays and no daily water consumption.

Conclusions:

Future interventions to prevent overweight should target these behaviors.

The ToyBox-study is funded by the Seventh Framework Programme (CORDIS FP7) of the European Commission (grant agreement n° 245200).

S33.3

Fluid intake from beverages of preschool children and associations with SES and ethnicity of the parents: The ToyBox-study

Authors:

Lea Maes, An-Sofie Pinket, Violeta Iotova, Piotr Socha, Berthold Koletzko, Luis Moreno, Yannis Manios, Ilse De Bourdeaudhuij

Purpose:

To assess the fluid intake from beverages of European preschoolers and associations with maternal education and parental ethnicity.

Methods:

Participants in 6 countries were part of a school-based cross sectional survey of 3 to 6 year olds within the ToyBox-study. A standardized protocol was used and parents filled in socio-demographic data (years of education of the mother, country of birth of the parents and language spoken at home) and a semi-quantitative food frequency questionnaire. Associations were assessed with Manova's.

Results:

Mean fluid intake from beverages was 792ml/day (n=7622); water: 560ml/day (n=7365), of tea: 73ml/day (n=4741), sugared soft drinks: 61ml/day (n=5495), light soft drinks: 15ml/day (n=3263), fresh fruit juice: 67ml/day (n=5890), pre packed fruit juice: 102ml/day (n=6795), smoothies: 24ml/day (n=3986). Non-native children consumed more water and less sugared soft drinks.

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Overall and in 3 of the 6 countries, children of less educated mothers consumed more light soft drinks, however these children consumed also more fresh fruit juice. Overall and in most of the countries sugared soft drinks were consumed more by children of less educated mothers (except from Poland where children of less educated mothers drank more sugared soft drinks)

Conclusions:

Water intake should be enhanced especially in native children and intake of fruit juice, sugared and light soft drinks should be discouraged, especially light soft drinks should be discouraged in children from lower SES.

The ToyBox-study is funded by the Seventh Framework Programme (CORDIS FP7) of the European Commission (grant agreement n° 245200).

S34

Promoting healthy diet and physical activity among men, women, and children with mobility impairments

Moderator: Tracey Ledoux, University of Houston, Houston, TX, USA

Presenters: Tracey Ledoux, Jim Rimmer, Marie Josee Perrier, Marsha Saxton, Stephanie Silveira

Discussant: Margaret Nosek, Baylor College of Medicine, Houston, TX, USA

Purpose:

Ten percent of the world population has a mobility impairment. Obesity rates among those with mobility impairments are nearly double that of the general population. Mobility impairment increases risk for obesity, yet there is a paucity of research on facilitators, barriers, and effective interventions to promote healthy eating and physical activity (PA) behaviors for this population. To discuss research on factors that promote healthy diet and PA behaviors among men, women, and children with mobility impairments.

Rationale:

Obesity among individuals with mobility impairments is an understudied area. We hope to stimulate innovative research among an international multidisciplinary audience of health behavior scientists.

Objectives:

To discuss 1) the Cycle of Disability and Weight Gain, a conceptual model for understanding obesity risk among those with mobility impairments, 2) describe PA and nutrition behaviors among children with disabilities, 3) facilitators and barriers to PA among those with mobility impairments, and 4) components of a nutrition and PA weight loss intervention for mobility impaired women.

Summary:

Individuals with mobility impairments face unique barriers to and facilitators of maintaining a healthy diet and PA behaviors to prevent obesity. Based on these factors and unique needs of those with mobility impairments, a tailored intervention approach is needed. The latest research regarding facilitators, barriers, and intervention requirements will be presented in this symposium. Presenters will use the Cycle of Disability and Weight Gain to describe their outcomes.

S34.1

Lifestyle behaviors of male and female Youth With Disabilities

Authors:

Kerri A. Vanderbom, Tapan Shirish Mehta, Kiyoshi Yamaki, Brienne Davis Lowry, Laurie A. Malone, Kathryn Yamamoto Henley, Jim Rimmer

Purpose:

Overweight/obesity is a significant health issue among youth with disabilities (YWD). Research has demonstrated a higher prevalence of obesity/overweight among females compared to males with conditions such as spina bifida and Down syndrome. To effectively address overweight/obesity and promote health, there is a critical need to understand

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the antecedents of overweight/obesity among YWD and the disparities between sexes. Therefore, the purpose of this study was to describe health behaviors of YWD and to compare males and females.

Methods:

A national online survey was conducted to examine PA and nutrition behaviors of YWD ages 12 to 18 years. Participants were recruited through various national and local disability organizations. Descriptive statistics were computed for the group and by sex.

Results:

A total of 477 YWD responded to the survey (M age = 15.7 yrs. \pm 2.14). Forty-seven percent of participants did not meet the recommended PA guidelines of 60 minutes/day. When males and females were compared, 44% and 54%, did not meet the PA guidelines, 29% and 38% watched 3 or more hours of T.V. /day, 13% and 9% reported having two or more sugar-sweetened beverages/day, and 37% and 30% ate at restaurants 2 or more times/week, respectively.

Conclusions:

Results indicate that YWD are a sedentary population with differences in health behaviors between males and females. Customized PA and nutrition interventions targeting male and female YWD are needed. Understanding the health behaviors of YWD is important to inform future interventions to improve overall health.

S34.2

Stories that move: Peer mentors' stories of sport and spinal cord injury (SCI)

Authors:

Marie-Josée Perrier, Brett M. Smith, Amy E. Latimer-Cheung

Purpose:

Individuals with spinal cord injury (SCI) who engage in sport accrue more minutes of higher intensity leisure-time physical activity (LTPA) than those who participate in other LTPAs. Peer mentorship is widely used to promote sport in disability and adapted sport organizations; however, little is known about how peer mentors promote sport to their mentees. Therefore, our objective was to explore what resources peer mentors use to construct their stories of sport and SCI, how these stories are constructed, and for what purpose.

Methods:

Thirteen peer mentors participated in injury and sport history interviews. Data were analysed using a dialogical narrative analysis.

Results:

Four key observations were made. 1) Participants used Frank's quest narrative as a resource to construct stories about SCI and sport post-injury. 2) Watching athletes engage in sport changed how participants saw "disability"; here, participants were exposed to enacted quest narratives. 3) Sport was a key storied environment in which participants learned a counter-narrative to the personal tragedy model of disability. By engaging in sport, they reclaimed an active body post-SCI and felt they prevented the negative outcomes of SCI (e.g. obesity). 4) Participants became peer mentors to share the knowledge they gained through sport with inactive peers.

Conclusions:

Given that the quest narrative does not align with other disability narratives (e.g. restitution, chaos), peer mentors' stories may not appeal to the broader disability population. Implications for health promotion and peer mentorship in the context of sport and the broader LTPA environment will be discussed.

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S34.3

Hard bodies: Historic and current cultural influences on disabled people's engagement in sport, fitness and dance

Author:

Marsha Saxton

Purpose:

This study explores the participation of people with disabilities in sport, fitness, dance and recreational activities in a multi-agency collaborative program.

Methods:

Sixty-three participants with disabilities were interviewed individually and in focus groups, drawing upon a wide range of people and experiences, from Paralympic athletes and professional dancers, to those who'd never participated in any physical activities.

Results:

What emerged were significant insights into factors that may engage and encourage participation in physical movement, and other factors that discourage or prohibit participation. Through the lens of sport and movement, the analysis and discussion takes a long view into the history of disability discrimination, an example being the charged concept and indeed the actual word, "fitness" used during the Eugenics Movement to dismiss and invalidate the worth and existence of people with disabilities, along with other marginalized populations; the "unfit" were systematically targeted with elimination.

Conclusions:

Authors discuss how these archaic attitudes, along with the present time intrusion of numerous architectural and attitudinal barriers may become internalized, understandably, as resistance to participate in fitness activities. Participants, instructors and other resource people offer strategies to encourage and support disabled people in the world of sport and movement.

S34.4

GoWoman: A weight loss program for women with mobility impairments

Authors:

Stephanie Silveira, Tracey Ledoux, Susan Robinson-Whelan, Dan O'Connor, Rosemary Hughes, Rebecca Lee, Tom Nosek, Margaret Nosek

Purpose:

To use Community Based Participatory Research methods to identify necessary modifications for an evidence-based behavioral weight loss program (i.e., the Diabetes Prevention Program, DPP) to meet the needs of women with mobility impairments.

Methods:

An expert panel and a Community Advisory Board (CAB) reviewed the curriculum from the DPP. The panel consisted of experts in behavioral science, disabilities, physical activity, nutrition, and measurement. Five women with disabilities (i.e., target audience for intervention) served on the CAB. The expert panel made initial modifications based on research literature and Social Cognitive Theory. The CAB recommended modifications based on personal experience with disabilities.

Results:

The expert panel met twice a month for four months and decided to adapt the DPP to be delivered virtually (i.e., via Second Life, SL), to include greater emphasis on psychosocial factors related to disabilities and weight management (e.g., social support, stress), to alter physical activity recommendations to accommodate a variety of disabled populations, to provide alternative methods for self-monitoring progress (i.e., circumference measures of waist, neck, and thigh rather than weight), to modify diet recommendations with gender (e.g., nutrition issues in menopause) and

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disability status (e.g., appetite disturbances related to medical condition) sensitivity. The CAB met eight times and provided suggestions for topics a weight loss intervention should address and feedback on curriculum organization, relevance, and value of topics.

Conclusions:

Together, a multidisciplinary expert panel and a CAB identified several modifications for evidence behavioral weight loss programs to meet the needs of women with mobility impairments.

S35

Active Offices: Can ‘activity-promoting’ computer workstations reduce the risk of occupational sedentary exposure for office workers?

Moderator: Leon Straker, Curtin University, Perth, WA, Australia

Presenters: Maike Neuhaus, Ronald Cox, Catrine Tudor-Locke

Purpose:

To showcase the state of the evidence for the efficacy of alternative computer workstations to promote activity along with how this knowledge can be effectively translated into workplace settings.

Rationale:

Sedentary behaviors are estimated to contribute 6% of the health burden in industrially advanced countries. For office workers, occupational exposure can account for half of their overall sedentary exposure. To enable office workers to be productive without excessive sedentary exposure, both laboratory and field-based studies have evaluated the use of alternative ‘activity-promoting’ workstations, such as height-adjustable or treadmill desks. These studies originated in the ergonomics field, with a focus on preventing musculoskeletal symptoms. More recently, they have focused on cardiometabolic benefits and task performance. Findings suggest a range of potential benefits, but it remains unclear whether these can be successfully implemented to enable sustained reductions in office workers’ sedentary time whilst maintaining worker productivity. This symposium will discuss the current state of evidence on the efficacy and feasibility of activity-promoting computer workstations to reduce sedentary behavior. This efficacy and translation is directly related to the conference focus of behavioral aspects of activity. Further, as a substantial proportion of the workforce spends the majority of their work time at a computer workstation the reach of successful public health interventions in this area is extensive.

Objectives:

- 1) Provide a summary of the evidence for the efficacy of activity-promoting workstations
- 2) Provide an opportunity for sharing as yet unpublished evidence
- 3) Provide a discussion of the feasibility associated with translating research into practice
- 4) Identify gaps in efficacy and translation knowledge

Summary:

The session is organised in sections on impact and efficacy and on translation. Three formal presentations will provide a summary of the state of published knowledge on the impact and efficacy of activity-promoting computer workstations. This will be followed by a knowledge sharing session where audience members provide breaking news on impact and efficacy. The second section will involve a discussion on the issues around feasibility and research-to-practice translation, initiated by three brief presentations by the same presenters.

S35.1

What is the evidence that activity-permissive workstations reduce sedentary time in office workers?

Authors:

Maike Neuhaus, Elizabeth G Eakin, Leon Straker, Neville Owen, David W Dunstan, Genevieve N Healy

Purpose:

The purpose of this systematic review was to summarise the evidence on the impact of activity-permissive workstations on office workers' sedentary time, and their feasibility.

Methods:

In July 2013, an extensive database search was conducted to identify relevant peer-reviewed publications. Of 2324 unique publications, 10 met inclusion criteria. An additional three publications were identified through cross-references and authors' personal libraries.

Results:

Studies evaluated height-adjustable desks (n=8), treadmill desks (n=4; one of which also included a cycle ergometer), and pedal machines (n=1). Seven implemented behavior change strategies in addition to the alternative workstations. All samples consisted of desk-based workers (average sample size: n=27; range: 11-62). Median intervention duration was four weeks (range: 2 weeks-1 year). Twelve studies reported statistically significant reductions in sedentary time during work hours (n=11; range: 58-143mins or 1.7-25%) or total daily (n=2; range: 91-182mins). Nine reported average reductions of ≥60mins. Common characteristics among these include: Use of height-adjustable desks (n=7), availability of workstations for individual use (i.e. not shared; n=9), and implementation of behavioral strategies in addition to the workstations (n=5). Eleven studies reported on feasibility, with findings indicating overall high preference for activity-permissive workstations, without disruptions to usual work practices being identified.

Conclusions:

Preliminary results of this systematic literature review suggest that activity-permissive computer workstations are an effective and highly feasible means to reducing sedentary time in office-based workplaces. However, best-practice approaches are yet to be identified.

S35.2

What is the evidence that active workstations can impact task performance or have other positive effects for office workers?

Authors:

Ronald Cox, Christina Ohlinger, Randal Claytor, Amanda Zylstra

Purpose:

The purpose of this review was to evaluate real and perceived cognitive or motor performance impacts that could be barriers to sustained use of active workstations, along with other possible health benefits.

Methods:

Single case studies, laboratory investigations and work place studies were examined for evidence on the cognitive and motor performance effects associated with active workstations.

Results:

The literature is remarkably consistent in reporting small but significant decrements in motor tasks attempted while using an active workstation. These decrements appear at the level of the simplest motor task and increase in severity with the complexity of the motor demand (e.g. mousing). However, the perceived decrement by users often exceeds the actual decline in performance. Moreover, short training or acclimation periods ameliorate many of these issues. Interestingly, alterations in walking mechanics manifest when attempting dual task efforts, however, these also quickly dissipate with brief practice. Cognitive tasks appear much more robust to disruption by the dual task nature of workstation use. The limited data on worker productivity provides some support for the contention that active workstation

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use does not unduly compromise worker output. A possible additional benefit of the low intensity activity attendant to workstation use is improved glucose clearance.

Conclusions:

If there are few experienced benefits, active workstation users may struggle to stay motivated to walk and work. Efforts to enhance use should focus more on covert health benefits and less on weight loss and future research efforts should identify behavioral barriers to active workstation use.

S35.3

What is the evidence that alternative workstations can increase energy expenditure for office workers?

Authors:

Catrine Tudor-Locke, John Schuna, Laruen Frensham, Mahara Proenca

Purpose:

Computer workstation alternatives are novel approaches that promise to re-balance the disrupted energy equation of sedentary workplaces. The purpose of this systematic review is to present the energy expenditure of various workstation alternatives measured in controlled studies and real world usage patterns reported in interventions.

Methods:

A keyword search and selective review of titles, abstracts, and reference sections identified 8 controlled studies of computer workstation alternatives studied during simulated or real work tasks and 8 intervention studies.

Results:

There appears to be little variation in energy expenditure associated with working while sitting in an office chair, sitting on a stability ball, or even standing (together averaging approximately 1.3kcal/min), suggesting that habitual use of these particular workstation alternatives would have little impact on reducing worker body weight relative to the traditional seated condition. In contrast, treadmill desks and pedal desks appear to present a greater potential impact for elevating energy expenditure (approximately 3-4 kcal/min). Behavior support/education appears to increase usage patterns of sit-stand desks in the workplace, but use can still be described as less than optimal. Although individual avid users may walk on a treadmill desk for 4 hours/day, the modal use was 30min/day, with up to 90min/day reported in select groups. Extrapolation from accelerometer data collected during treadmill desk interventions estimates an energy expenditure range from 100-197kcal/day over seated working conditions.

Conclusions:

Active workstations (i.e., treadmill desks and pedal desks) in particular represent an important potential strategy for mitigating the diminished energy expenditure inherent to contemporary office-based workplaces.

S36

Applying concept mapping to rethink the potential influences of the school nutrition environment on dietary habits of school-aged children across countries

Moderator: Nanna Lien, University of Oslo, Department of Nutrition, Oslo, Norway

Presenters: Stef Kremers, Eva Roos, Mai Chin A Paw, Martine Staib

Discussant: Leslie A. Lytle, Gillings School of Global Public Health, Chapel Hill, North Carolina, USA

Purpose:

The purpose of the symposium is to discuss conceptual models of the school nutrition environment developed largely by experts contrasted against the views of other stakeholders such as pupils, teachers and parents from different countries.

Rationale:

The school has an important role in promoting good nutrition, because children of all socio-economic backgrounds can be reached for a long period of time, it is a place for learning, and schools can potentially also influence their staff, the parents and the wider community. Several conceptual models of the school nutrition environment exist, but analytic studies have had limited success in showing associations between school level factors and dietary behaviors of their pupils. This lack of associations hampers the development of effective school level interventions to promote healthy eating. One cause of the lack of associations may be differences in conceptualization of the school nutrition environment between experts and other stakeholders (i.e. pupils, teachers, parents). Traditionally stakeholder interviews (individual or as focus groups) have been employed to elicit the most important factors, but the results might be biased by conveying the views of those most verbal and the interpretation of the researcher. The concept mapping method combines qualitative and quantitative methods in such a way that the concepts are more likely to be grounded in the view of all the stakeholders participating in the group. The symposium is based on a 2 day workshop in October 2013 among the researchers submitting this proposal.

Objectives:

The symposium will:

1. Provide an introduction to the concept mapping method for systematic extracting and synthesizing the views of various stakeholder groups relevant for the school nutrition environment.
2. Present concept maps of the school nutrition environment based on input from multiple stakeholder groups (experts, pupils, teachers, parents) from different countries using the concept mapping method.
3. Engage the audience in interpretation and integration of the maps with regards to future use in research.

S36.1**Concept mapping as a method and the concept map from an international group of experts****Authors:**

Stef PJ Kremers, Henrica CW de Vet, Eva Roos, Rikke Kroelner, Mai JM Chin A Paw, Lukar E Thornton, Lene F Andersen, Nanna Lien

Purpose:

The purpose of the present study is to demonstrate Concept Mapping as a process for concept definition that may be used for the development of research instruments and theory building in the field of behavioral nutrition and physical activity. We applied the method to the school nutrition environment.

Methods:

To define the breadth and contents of concepts related to the school nutrition environment, we conducted a concept-mapping workshop with 11 experts from five different countries. A carefully crafted seeding statement was presented to the group, who were then asked to work alone for 10 minutes to generate ideas in response to the statement. Participants were asked to write down their responses and a facilitator then asked the participants to take turns presenting one item from their list, until all items were presented. Once all statements had been presented, participants were asked to independently sort the statements into conceptually similar groups according to any system that made sense to them. Multidimensional scaling and cluster analysis were used to process participants' input and generate two-dimensional maps of key concepts related to the school nutrition environment.

Results:

One hundred statements were generated and six major clusters were observed - Policy, Price, Availability, Routines, Social influences, Student characteristics - each with two or three subclusters. The method appeared to be feasible when spread over two days.

Conclusions:

Concept Mapping is a grounded approach that may lead to new insights and conceptualisations valuable for the study of determinants of dietary behavior and/or physical activity.

S36.2

Concept mapping of school nutrition environment among various stakeholders in Finland

Authors:

Eva Roos, Suvi Määttä, Elviira Lehto, Reetta Letho, Carola Ray, Henrica CW de Vet

Purpose:

To investigate the views of the stakeholders in the Finnish school nutrition environment. Finnish municipalities have arranged a free lunch for all the pupils in elementary schools since 1948. According to current national law, school-children must every school day be served a proper meal which consists of main course, fresh vegetables, bread, bread spread and milk. The role of school meals is not only to nourish the children, but also to be a pedagogical tool to teach good nutrition and eating habits. Most pupils eat the main course, but only 10-35 % of the pupils eat all the parts of the meal daily. In addition to school meals, snack opportunities might be provided. More knowledge is needed of how school nutrition environment influences dietary intake and children's dietary habits. The pupils are one of the key stakeholders and therefore, their views are important to map. Also, teachers' viewpoints are beneficial to map because of the educational aspect of the school meals.

Methods:

The concept mapping method will be conducted in groups of 8-10 stakeholders from 2 primary schools, preferably from low and high socio-economic areas, in Helsinki region in spring term 2014. The invited stakeholders will be pupils, aged 11-12, and teachers in the primary schools.

Results:

One concept map will be conducted for each stakeholder group. Similarities and differences in the maps within and across the stakeholder groups will be presented.

Conclusions:

Recommendations for future use of the maps will be made.

S36.3

Concept mapping of school nutrition environment among various stakeholders in Norway

Authors:

Martine Staib, Mona Bjelland, Henrica CW de Vet, Lene F Andersen, Nanna Lien

Purpose:

The formal elements of the school nutrition environment in Norwegian primary schools consists of a packed lunch brought from home, milk and fruit subscription programs, home economics being taught as a separate subject and school meal guidelines issued by the Directorate of health. In addition, foods and drinks are brought to school by pupils or parents or used by school personnel in various socio-cultural situations. Given these circumstances the views of the teachers and parents are especially important for the school nutrition environment, but as the pupils often are the link between these stakeholder groups it is also important to map their views.

Methods:

The concept mapping method will be conducted in groups of 8-10 Norwegian stakeholders from 2 primary schools (i.e. ages 6-13), preferably from a low and high socio-economic area, in the Oslo area in January 2014. The stakeholders invited will be pupils (age 11-12 years), parents of children in the same age group and teachers in the primary schools. The two maps from each of the stakeholder groups will be integrated into one.

Results:

There will be one concept map from each Norwegian stakeholder groups. Similarities and differences in the maps within and across the stakeholder groups will be presented.

Conclusions:

Recommendations for future use of the maps will be made.

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S36.4

Concept mapping of the school nutrition environment among various stakeholders in the Netherlands

Authors:

Mai Chin A Paw, Maaïke Droogers, Elsje Caro, Henrica de Vet, Teatske Altenburg

Purpose:

The formal elements of the school nutrition environment in Dutch primary schools consists of a bagged snack and lunch brought from home. Guidelines regarding the foods and drinks brought to school are varying between schools. Therefore, children, teachers and parents views and behaviors seem especially important for the dietary habits at school.

Methods:

The concept mapping method will be conducted in groups of 8-10 stakeholders from 2 primary schools, preferably from a low and high socio-economic area, in the Amsterdam area. The concept mapping procedure will be conducted in two groups of pupils (aged 6-12 years), parents of children in the same age group and teachers of the primary schools. The two maps from each of stakeholder groups will be integrated into one, resulting in a total of three concept maps.

Results:

Similarities and differences in the maps within and across stakeholder groups will be presented as well as the lessons learned from the concept mapping procedure in the different stakeholder groups.

Conclusions:

Recommendations for future use of the maps as well as the concept mapping procedure will be formulated.

S37

Active video games: A debate on whether active video games can increase physical activity in the paediatric population

Moderator: Leon M Straker, Curtin University, Perth, WA, Australia

Presenters: Tom Baranowski, Leon Straker, Ralph Maddison

Discussant: Leon M Straker, Curtin University, Perth, WA, Australia

Purpose:

To debate the state of the evidence for the efficacy of active video games to enhance physical activity in children.

Rationale:

Video games are widely used by children and use has increased over the last two decades. Many children now play video games for substantial durations. Traditional video games are sedentary and this has led to concerns that their use increases the sedentary exposure of children and diminishes the participation in physical activity. Replacing these sedentary video games with active video games, requiring limb or whole body movement, may be a way to allow children to enjoy video games without detrimental effect on their activity time. Laboratory studies have shown that children can play active video games at intensities likely to result in beneficial cardiometabolic outcomes. This has led to a number of trials investigating whether giving children access to different active video games can result in meaningful improvements in activity time that are sustainable. This symposium will discuss the current state of evidence on the efficacy and feasibility of active video games to increase physical activity and decrease sedentary behaviors. These goals are directly related to the conference focus of behavioral aspects of activity. Further, as a substantial proportion of children regularly play video games, the reach of successful public health interventions in this area is extensive. This topic is quite contentious and should result in a very stimulating discussion.

Objectives:

- 1) Provide an overview introduction of the broader field of video game research (based on the pre-ISBNPA satellite conference chaired by Tom Baranowski): Baranowski 10mins
- 2) Provide a summary of the published evidence for the efficacy of active video games to increase physical activity arguing that the changes achieved are not clinically meaningful: Straker 10 mins

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- 3) Provide a summary of the published evidence for the efficacy of active video games to increase physical activity arguing that the changes achieved are clinically meaningful: Maddison 10 mins
- 4) Provide a discussion of efficacy and translation issues: Straker 30 mins

S37.1

CON: Use of active video games do not result in sustained increases in physical activity and reductions in sedentary behavior

Authors:

Leon Straker, Rebecca Abbott, Erin Howie

Purpose:

Using the existing field trial evidence, the purpose of this presentation is to show that active video games do not result in sustained and meaningful increases in physical activity and reductions in sedentary behavior.

Methods:

Randomised controlled intervention studies assessing the effects of active video games on children's physical activity and sedentary behavior in the home-setting were identified and reviewed. Laboratory studies, and studies not in the home setting (e.g. school) were not included.

Results:

Seven trials ranging from pilot studies of 20 children through to large studies of >300 children were identified. Ages ranged from 7-16 years, with two of the studies including only overweight and obese children. Intervention technologies included DDR (n=2), EyeToy (n=3), Wii (n=1) and jOG (n=1). Objective measurement of physical activity by accelerometry was reported in all studies, and five studies also used self-report. Despite, self reported increase in physical activity (n=2), none of the studies showed positive effects of intervention on objectively measured daily physical activity. Significant reductions in self-reported sedentary screen behavior were reported (n=2), though in both these studies, no changes were observed in objectively measured sedentary time. Most of the studies reported reduction of active game use through the trials.

Conclusions:

Whilst laboratory studies show that children can be less sedentary and more active when playing active video games compared with traditional sedentary video games, the evidence from field trials shows that positive changes in habitual activity and sedentary behavior are minimal at best and unlikely to be sustainable.

S37.2

What is the state of knowledge about video game playing and children?

Author:

Tom Baranowski

Purpose:

This presentation will provide an overview of the state of knowledge concerning video game play by children, including the amount and nature of game use by children and the types of research currently being conducted.

Methods:

Evidence from the literature, along with evidence presented at the ISBNPA 2014 pre-conference: Games for Increasing Physical Activity: Mechanisms for Change will be summarised. The presenter is one of the organizers of the pre conference to be held in Houston which has 11 presentations and 4 working group discussions. The literature and pre-conference evidence covered will include taxonomy of exergames; exergaming physiology; mechanisms of behavior change in exergames; competition versus cooperation; exergames and disabilities; unanticipated effects of exergames; the dangers of too much behavioral science; how to enhance exergame fun and engagement; effective behavior change design; formative research procedures; and optimal design for disabilities.

Results:

The current exposure of children to electronic games will be presented, along with details of the various types of video games including active video games. The nature of evidence being provided from laboratory, field and epidemiological studies will be summarised along with an overview of the theoretical frameworks and issues.

Conclusions:

The review will provide a basis for audience understanding of the detailed issues to be debated in the following presentations specifically focused on video games to enhance habitual physical activity in the general population of children.

S37.3

PRO: Use of active video games can result in sustained increases in physical activity and reductions in sedentary behavior

Author:

Ralph Maddison

Purpose:

Using available research evidence, this presentation will demonstrate how active video games have a positive effect on physical activity and sedentary behavior as well as sustained video game play.

Methods:

Data were obtained as part of a systematic review of observational and randomised controlled intervention studies assessing the effects of active video games on children's physical activity and sedentary behavior.

Results:

Eleven randomized controlled trials (RCTs) and five observational studies examined effects of active video games on habitual activity. While many of the trials reported modest effects on time spent engaging in total physical activity, positive effects were found for light and moderate intensity activity. Differences were observed depending on the physical activity measure used and the intervention duration. One of the largest trials to date (n=322) reported sustained use of playing active video games at 24 weeks (increase of 10 min) in the intervention group accompanied by a reduction in the change in daily time (10 min) spent playing nonactive video games.

Conclusions:

There is evidence supporting the effect of active video games on physical activity and for sustained use of active video game play. However this area of research is limited by a lack of adequately powered trials of sufficient duration to draw definitive conclusions. Measurement issues also limit this area and will be highlighted.

S38

Cancer and lifestyle interventions in older adults

Moderator: Annie S Anderson, University of Dundee, Dundee, Scotland, UK

Presenters: Kristin Campbell, Hanna van Waart, Erica James, Amanda Daley

Discussant: Laurien Buffart, VU University Medical Center, Amsterdam, The Netherlands

Purpose:

The promotion of a healthy lifestyle for the reduction of cancer occurrence (and recurrence in cancer survivors) remains a relatively neglected area in health promotion. This symposium aims to present and discuss intervention studies focused on cancer risk behaviors and the opportunities and challenges of behavior change in older adults.

Rationale:

It is recognised that, in older age, people maybe have more fatalistic views about cancer and are less likely to initiate lifestyle change, although utilising teachable moments such as the cancer screening setting may provide an appropriate opportunity to engage people in risk reduction activities. A number of studies have demonstrated that cancer survivors

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are motivated and able to make dietary and lifestyle modifications including weight loss although the challenges of trials are rarely discussed.

Objectives:

We aim to discuss

- a) Colorectal cancer (CRC) screening as an opportunity for initiating cancer risk reduction behaviors
- b) The response of older adults to interventions of diet, physical activity (including resistance and endurance training) and weight loss
- c) Difficulties around raising the issue of weight loss and behavior change in cancer survivors
- d) The use of single or multi health behavior change strategies to achieve lifestyle change in this population

Summary:

Intervention trial data will be presented on the CRC screening setting as an opportunity for initiating change, reporting both qualitative (BeWEL study) and quantitative findings. Weight loss and physical activity interventions for breast cancer risk reduction (and in survivors) will then be discussed drawing on trial experience. This will be followed by audience participation on issues around raising the issue of behavior change in cancer patients. Finally, we will discuss a recent meta-analysis of diet and physical activity behavior change trials for cancer survivors by single or multiple behavior change status.

S38.1

Effect of low versus high intensity physical exercise during chemotherapy on physical fitness, fatigue and chemotherapy completion rates: Results of a randomized, controlled trial

Authors:

Hanna van Waart, Martijn Stuiver, Gabe Sonke, Wim van Harten, Neil Aaronson

Purpose:

Exercise programs have been demonstrated to have a beneficial effect on patients undergoing chemotherapy. The optimal intensity of such programs is as yet unknown. This study evaluated the efficacy of a low intensity, home-based, self-management physical activity program (Onco-Move), and a high intensity, structured, supervised exercise program (OnTrack) in terms of maintaining or enhancing cardiorespiratory fitness and muscle strength, minimizing fatigue, enhancing health-related quality of life, and maximizing chemotherapy completion rates of patients undergoing adjuvant chemotherapy for breast and colon cancer.

Methods:

In this multicenter, prospective, RCT, patients were randomized to: Onco-Move, OnTrack or a Usual Care control group. Outcomes were assessed prior to chemotherapy, at the end of chemotherapy, and 6 months later (only first follow-up results will be presented).

Results:

Participants in OnTrack had significantly less decline in cardiorespiratory fitness ($p < 0.005$), and enhanced muscle strength ($p = 0.022$) as compared to the control group. Both exercise groups reported significantly better physical functioning ($p = 0.001$) and less physical fatigue ($p = 0.001$), pain ($p = 0.026$), nausea ($p = 0.040$) and constipation ($p < 0.001$) at follow-up than the control group. Significantly more participants in OnTrack completed their prescribed chemotherapy regimen without dose adjustments than those in the control group (84% versus 62%) ($p = 0.001$).

Conclusions:

High intensity physical exercise during chemotherapy enhances muscle strength, reduces the decline in cardiorespiratory fitness and fatigue, and leads to less dose reductions in chemotherapy regimens. Low intensity exercise also has a salutary effect on physical fatigue and other symptoms, but less so than high intensity exercise.

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S38.2

Weight loss for reduction in breast cancer occurrence and recurrence: What is the mechanism? How much is enough?

Authors:

Kristin L Campbell, Karen E Foster-Schubert, Cheri Van Patten, Lynda Balneaves, Anne McTiernan

Purpose:

To review the evidence from human intervention trials of weight loss on biological mechanisms linking lifestyle to breast cancer risk and recurrence in women, focusing on the most promising biomarkers and what amount of weight loss is needed to alter proposed biomarkers.

Methods:

Results from the Nutrition and Exercise in Women (NEW) Trial, a 4-arm randomized controlled trial of dietary weight loss alone, physical activity alone, dietary weight loss and physical activity combined, and control (n= 439) examining biomarkers will be presented, along with both quantitative and qualitative findings from a pilot study of a dietary weight loss intervention in breast cancer survivors.

Results:

In postmenopausal women, weight loss of 10% of baseline body weight, with reduced calorie diet alone or combined with physical activity, resulted in positive changes in proposed biomarkers, particularly sex steroid hormones. In breast cancer survivors, weight loss of 7% of baseline body weight resulted in positive changes in biomarkers, however women reported the major challenge for adherence to the program was the logistics of fitting dietary change and exercise into busy work and family schedules.

Conclusions:

Human intervention trials support the role of weight loss to alter proposed biomarkers of breast cancer risk and recurrence. However, challenges around adherence to weight loss interventions and achieving weight loss maintenance remain.

S38.3

Behavior change in cancer survivors - single or multiple behavior change?

Authors:

Erica James, Camille Short, Luke Wolfenden, Fiona Stacey, David L Lubans, Kathy Chapman, Kerry Courneya, Ronald Plotnikoff

Purpose:

There is increasing interest in multiple health behavior change (MHBC) interventions that target several behaviors (e.g., aerobic and resistance activity, several aspects of diet) compared to single health behavior change (SHBC) interventions. Targeting multiple behaviors concurrently offers the potential of increased health benefits, maximized health promotion, and reduced health care costs. On the other hand, concurrent interventions may be overwhelming, too time demanding, may fail to address any single behavior in sufficient depth and reduce intervention adherence. The primary purpose of this systematic review is to evaluate the effects of single versus MHBC interventions among cancer survivors.

Methods:

Eligibility criteria, data sources, selection of studies, data extraction, and subgroup analyses were identified a priori and according to PRISMA guidelines. Following assessment of risk of bias, results were synthesized qualitatively and (where possible) via meta-analysis using the sub-group comparisons of MHBC and SHBC trials.

Results:

Following title/abstract review of 5819 publications, and full text review of 368 papers, 27 trials (published in 41 articles) met the eligibility criteria. Included studies were classified as: 1) Behavior change trials (i.e., primary purpose

to change behavior) or health outcome trials (i.e., primary purpose was to change a health outcome) encompassing a behavior change intervention, and; 2) SHBC or MHBC trials.

Conclusions:

Both SHBC and MHBC interventions are effective at improving physical activity and dietary behaviors in cancer survivors. Further work is needed to incorporate survivors' preferences in intervention design, to explore the impact of components on adherence, and economic analyses.

S38.4

Is it feasible to reduce intake of red and processed meat and increase exercise levels in people treated for a colorectal adenoma? A feasibility RCT

Authors:

Amanda J Daley, Aliko Taylor, Nick Freemantle, Matthew Brookes, Janet Jones, Chloe Grimmett, KK Cheng, George Dowswell

Purpose:

There is convincing observational evidence that consumption of red and processed meat increases the risk of colorectal cancer and that higher levels of exercise reduce risk. However, no definitive RCT has demonstrated the benefit of changing these behaviors on reducing polyp recurrence. This study aimed to determine whether such a trial could be conducted.

Methods:

Patients 60-74 years from the Bowel Cancer Screening Programme who had been diagnosed with an intermediate or high risk adenoma (I/HRA) at colonoscopy were invited to participate. Our intention was to conduct an RCT with 200 patients newly diagnosed with an I/HRA and allocate them to one of four groups; reduce consumption of red meat and eliminate processed meat, increase exercise levels, both, or make no changes for 12 weeks.

Results:

Recruitment was difficult because many patients believed their diet and exercise were already acceptable. Of 362 patients assessed for eligibility only 49 were eligible and consented. At follow up, the control group (n=14) reported consuming significantly more red/processed meat p/w ($p=0.029$) and participated in less vigorous exercise p/w ($p=0.01$) than the intervention groups (n=35).

Conclusions:

This study confirms the difficulties of developing interventions to change lifestyle behaviors in this population. Colonoscopy services seek to reassure patients that polyps have been removed but this means the significance of a polyp is often not understood by patients.

S39

New technologies to assess physical activity locations

Moderator: Jasper Schipperijn, University of Southern Denmark, Odense, Denmark

Presenters: Griet Vanwolleghem, Yan Kestens, Aaron Hipp

Discussant: Jacqueline Kerr, University of California, San Diego, San Diego, USA

Purpose:

Low levels of physical activity are linked to many health problems and there is a growing focus on finding ways to re-integrate physical activity into people's everyday life. Providing attractive activity supporting environments is one of the strategies that could help increase physical activity. In order for policy makers and planners to know which environments are supportive of which type of physical activity behavior, for which type of people, more conclusive evidence is needed. Moving from cross-sectional studies to natural experiments or intervention studies is one way forward. But also

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method development is required to provide researchers with better tools to assess the relation between physical activity behavior and physical activity locations.

Rationale:

Many studies indicate that there is a relation between physical activity behavior and environment, but at the same time the associations seem to be inconsistent. Part of the variation in findings could be due to imprecise measurement methods. Improving assessment methods, both of physical activity behavior and the environments it takes place in, using new technologies will provide a clearer picture of the associations.

Objectives:

The aim of this symposium will be to present some of the newest technologies to assess physical activity behavior and physical activity locations, as well as provide insight into the current challenges, opportunities and implications for future research.

Summary:

This symposium will provide an international perspective on new assessment methods for physical activity behavior and physical activity behavior locations and will include insight from speakers from the USA, Canada, Belgium and Denmark. The presentations will provide an introduction to Google Street-View based audits, use of webcams and crowdsourcing, an online activity location survey tool, and indoor position tracking with Bluetooth. The symposium will demonstrate the potential of these methods for future studies. The symposium will include a reflection on these new developments by Associate Professor, Dr. Jacqueline Kerr, one of the world's leading scientists in the use of novel technologies in health behavior research.

S39.1

Mapping environmental characteristics of cycling routes to school using Google Street View

Authors:

Griet Vanwolleghem, Delfien Van Dyck, Fabian Ducheyne, Ilse De Bourdeaudhuij, Greet Cardon

Purpose:

Recently, Google Street View provides a valuable and efficient alternative to observe the physical environment compared to traditional fieldwork. However, the use, reliability and validity of Google Street View in a cycling-to-school context is lacking. Intra- en inter-rater reliability of a newly developed audit instrument using Google Street View was examined and criterion validity of the virtual audit instrument against in-person field work was studied.

Methods:

Parents (n=52) of 11-to-12-year old Flemish children, who mostly cycled to school, completed a questionnaire and identified their child's cycling route to school on a street map. In total, 50 valid cycling routes were identified and physical environmental characteristics along those routes were evaluated with a newly developed audit using Google Street View (5 subscales; 37 items). To assess reliability, two researchers performed the audit. Criterion validity of the audit was examined by comparing the ratings based on Google Street View with ratings through field work.

Results:

The 37 individual items of the audit showed moderate to high intra-rater reliability (ICC/kappa range 0.47-1.00). For inter-rater reliability, 53% of the items showed an almost perfect agreement (ICC/kappa range -0.03-1.00). Criterion validity was acceptable for approximately 60% of the individual items (Pearson correlation/kappa range -0.20-1.00).

Conclusions:

The developed audit with Google Street View demonstrated acceptable reliability and validity and may be valuable for evaluation of physical environmental characteristics along a cycling route to school among children. Further adaptation and evaluation is needed to generalize the use of Google Street View in similar settings.

S39.2

Indoor tracking of physical activity behavior using Bluetooth and accelerometers - A pilot test

Authors:

Jasper Schipperijn, Gry Sidenius, Tine Bjerregaard Kryger, Lærke Mygind, Christine Kier Hansen, Peter Bentsen

Purpose:

To pilot test the Bluetooth based ZONITH Indoor Positioning System (IPS) and investigate if different indoor areas in a science museum are associated with different types of behavior.

Methods:

171 students (grade 6) were invited to participate in the study and were asked to wear a Bluetooth-enabled Global Positioning System (GPS) tracker (QStarz BT-Q1000x), and an accelerometer (ActiGraph GT3X). ZONITH Bluetooth positioning beacons were set-up in a large science museum, which made it possible to determine which participants were in which (predetermined) zones of the museum. The Bluetooth and GPS data were merged with the accelerometer data and total time and the proportion of time spent in moderate-to-vigorous physical activity (MVPA) were calculated per zone.

Results:

After some initial adjustments, the Bluetooth positioning beacons were capable of accurately recording most respondents in the different zones. Significant differences in activity levels between the different zones were found. Boys generally spent a higher proportion of time in MVPA compared to girls.

Conclusions:

Using the Bluetooth signal from the Qstarz GPS-trackers in combination with the 'zone' function of the ZONITH Indoor Positioning System made it possible to determine in which zone of the building participants spent time. Setting up the system took some time and effort, but the potential of determining where participants are when inside e.g. their school or workplace makes it possible to answer additional research questions. The combination of GPS and Bluetooth location data provided a more complete picture of participants' behavior during a 7-day period.

S39.3

Mapping activity spaces for health research: Findings from the RECORD Cohort study using a novel interactive map-based questionnaire

Authors:

Yan Kestens, Julie Vallée, Camille Perchoux, Benoit Thierry, Basile Chaix

Purpose:

Most studies exploring how built environment factors influence physical activity have focused on local characteristics of residential neighbourhoods. Yet, because people are mobile, it seems important to account for people's network of regular destinations to improve specificity in exposure estimates. We present VERITAS, a novel interactive map-based web application to collect precise spatial information on activity locations for health surveys. Regular destinations are compared to activity locations obtained from 7-day GPS tracking. Relations between activity locations and physical activity are described.

Methods:

Some 5,500 participants of the second wave of the RECORD Cohort Study (Paris, France) provided information on their regular destinations using the interactive VERITAS questionnaire. A sub-sample of 234 participants wore a GPS and an accelerometer. We present spatial indicators of participants' network of regular destinations, and the level of overlap with activity locations derived from 7-day GPS tracking. Correlations between environmental characteristics and physical activity levels are computed.

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Results:

In average, participants reported 14 distinct activity locations, for a total of over 70,000 reported activity locations in the second wave of the RECORD cohort study. GPS tracking shows over 85% of time is spent within 500 meters of a VERITAS reported activity location. Yet, about a third of the total 7-day energy expenditure occurred during transportation episodes.

Conclusions:

Map-based questionnaires offer interesting ways to collect information on individual's activity spaces. We will discuss usefulness of regular destinations for improved assessment of environmental exposures and evaluation of determinants of physical activity.

S39.4

Use of public outdoor webcams to create a census of physical activity

Authors:

Aaron Hipp, Deepti Adlakha

Purpose:

Public outdoor webcams capture physical activity across many international cities. Our team is developing methods to create a physical activity census of public places captured by these webcams.

Methods:

Using public webcams our team has captured a photo every half hour between May 2007 and December 2008 from two street intersections in Washington, DC. During this timeframe a built environment change - crosswalks - was instituted in each scene. 16,000 captured images from the webcams were uploaded to Amazon.com's crowdsource website, MTurk. Four MTurk workers annotated each scene for the number of pedestrians present. We analysed each weekday and month for pedestrian patterns pre- and post-built environment change.

Results:

An average of 1.2 pedestrians (range 0-19) was captured per photograph. January, November, December, and July had significantly fewer pedestrians (0.98-1.07 per scene) than May, June, August, and September (1.31-1.43). There was no significant difference in pedestrians between pre- and post-built environment change across the total comparable time (May-November 2007 versus May-November 2008, $n=3,972$ and $n=4,126$, respectively). However, when comparing month to month difference there were significant increases in pedestrians in the two months with the lowest overall number of pedestrians (July and November).

Conclusions:

Webcams and crowdsources provide a novel opportunity to develop a physical activity census and better understand use of public space, especially space experiencing built environment change. Results suggest increases in pedestrian activity post-crosswalk may be more significant during times of generally low active transport (heat of summer, cold of winter) compared to milder shoulder seasons.

S40

Parental involvement in obesity prevention interventions among children and adolescents

Moderator: Wendy Van Lippevelde, Ghent University, Ghent, East-Flanders, Belgium

Presenters: Sanne Gerards, Mona Bjelland, Wendy Van Lippevelde, Christina Ly

Discussant: Jo Salmon, Deakin University Australia, Melbourne, Australia

Purpose:

Given the significant relations between parenting styles and practices and children's energy balance-related behaviors, parents are indicated as one of the key actors in combating overweight and obesity within children and adolescents. Therefore it is generally recommended to actively involve parents in obesity prevention efforts. However, authors of

earlier family-including intervention research highlighted that it is difficult to determine whether or not parental involvement positively impacts on outcomes and to identify which strategies to engage parents were most effective due to the heterogeneity in study design, study quality, outcome variables, measurements, and poor intervention description including intervention fidelity, dose, and exposure of parents. Considering the difficulty to involve parents in interventions, the absence of process evaluation data can jeopardize the correct assessment of intervention effectiveness. There is a trend to include process evaluations in intervention studies however the content is often very different, there is no consensus about what should be included and the results of the process evaluations are often not systematically reported.

Rationale:

Since parents are one of the most important environmental actors in influencing children's and adolescents' energy balance-related behaviors, new insights about parental involvement in obesity-prevention interventions is essential for a conference focusing on promoting healthy eating and physical activity.

Objectives:

- to learn more about the effect of recent evaluated obesity prevention interventions focusing on children and adolescent and involving parents
- to discuss effective strategies to involve parents
- to discuss how to measure parental involvement in an efficient way
- to learn more about the importance of process evaluation data in the interpretation of effect evaluations of family-based interventions

Summary:

Effect evaluations and process evaluation data will be combined to learn more about the 'real' effectiveness of four obesity prevention family-based interventions in children and adolescents in order to gain new insights about parental engagement in obesity prevention.

S40.1**The effectiveness of Lifestyle Triple P in the Netherlands****Authors:**

Sanne Gerards, Dagnelie Pieter, Jessica Gubbels, Stef Buuren, Femke Hamers, Maria Jansen, Matthew Sanders, Stef Kremers

Purpose:

Lifestyle Triple P is a general parenting intervention which focuses on preventing further excessive weight gain in overweight and obese children. Results of an RCT testing the effectiveness of the intervention in 4-8 year old children will be presented.

Methods:

In total, 86 parent-child triads were recruited and randomly assigned to the intervention or control condition. Participants assigned to the intervention condition received a 14-week intervention consisting of group sessions and individual telephone sessions. Primary outcome measure was children's body composition, and secondary outcome measures were children's dietary behavior and physical activity level, and parenting measures (parenting practices, parental feeding style, parenting style, and parental self-efficacy). Outcome measures were measured at baseline, at short-term (4 months) and long-term (1 year). Multilevel multiple regression analyses were conducted to determine the effect of the intervention on outcome measures.

Results:

In total, 31 families did attend the intervention sessions. Of these, 81% were present at 5 or more sessions. Parents rated the intervention as 7.6 on a 10-point scale. No intervention effects were found on children's body composition. Analyses of secondary outcomes showed positive intervention effects on child behavior (soft-drink consumption, sedentary behavior, playing outside) and parenting measures (responsibility regarding physical activity, monitoring food intake, responsibility regarding nutrition, encouragement to eat, psychological control and satisfaction with and efficacy of parenting).

Conclusions:

Although the Lifestyle Triple P intervention showed positive effects on different child behaviors and parenting measures, no effects were visible on children's body composition.

S40.2**Effects on parents being involved in a dietary intervention through their child in the HHealth In Adolescents (HEIA) study****Authors:**

Mona Bjelland, Solveig Hausken, Ingunn Bergh, May Grydeland, Knut-Inge Klepp, Lene Andersen, Torunn Totland, Nanna Lien

Purpose:

The goal of the HHealth In Adolescents (HEIA) study was to promote healthy weight development in 11-13 year olds. Only a few studies have investigated effects on parents being involved in a dietary intervention through their child. The aim of this study was to assess whether parental intakes of fruit, vegetables and sugar-sweetened beverages (SSB) were affected by the intervention.

Methods:

In total, 849 mothers and 680 fathers participated in the pre-test and the 20 month post assessment. Parental intakes of SSB were collected assessing frequency and amounts (dl/week), while consumption of fruit and vegetables was assessed by frequency (times/week). Covariance analyses (ANCOVA) were conducted adjusting for pre-test values and education level. The Johnson-Neyman technique was used to analyze the heterogeneous regression cases found for intake of vegetables (mothers/fathers) and soft drinks (mothers) by education level.

Results:

No significant differences were found at pre-test, except for education level. In preliminary analyses a borderline significant difference in maternal intake of fruit ($P = 0.056$) was found, indicating a higher intake in the intervention group. By use of the The Johnson-Neyman technique we found that highly educated fathers in the intervention group had a higher intake at post-test compared to the control group when the pre-test intake was high. When the highly educated mothers' intake at pre-test was above 0.7 dl/week we found that the intervention group scored higher at post-test compared to the control group.

Conclusions:

The intervention may have affected mothers' fruit intake and the highly educated parents.

S40.3**The role of family-related factors in the effects of the UP4FUN school-based family-focused intervention targeting screen time among 10- to 12-year-old children: The ENERGY project****Authors:**

Wendy Van Lippevelde, Elling Bere, Maïté Verloigne, Ilse De Bourdeaudhij, Maartje Van Stralen, Nanna Lien, Johannes Brug, Lea Maes

Purpose:

The first aim was to examine the mediating role of family-related factors on the effect of the school-based family-focused UP4FUN intervention aimed at screen time among 10- to 12-year-old European children ($n=1940$). The second aim was to compare the UP4FUN intervention effects on children's screen time and parents' practices between the highly and low involved parents in the intervention condition.

Methods:

A pre-test-post-test design including intervention and control condition, was used to test the six-week UP4FUN intervention among children in five European countries in 2011. Self-reported data of children was used to assess their TV and computer/game console use per day and parents reported their practices related to screen time and their involve-

ment in the UP4FUN intervention components. Mediation analyses were performed using multi-level regression analyses (child-school-country).

Results:

The measured family-related factors did not mediate intervention effects on children's TV and computer/game console use since the intervention was not successful in changing the family-related factors. However, almost all TV-specific and half of the computer-specific family-related factors were associated with children's screen time. No significant difference in intervention effectiveness was found between the highly and low involved parents in the intervention condition.

Conclusions:

Future screen-related interventions should try to effectively target the home environment and family-related factors to increase intervention effectiveness given the significant relation between most of the family-related factors and screen time.

Trial registration: The study is registered in the International Standard Randomised Controlled Trial Number Register (registration number: ISRCTN34562078).

S40.4**Enhancing parental engagement in school health programs: Parent Teacher Association Healthy Lifestyles Chairs in Texas, USA****Authors:**

Christina Ly, Anne Kristine Aarestrup, Deanna Hoelscher, Andrew Springer, Nalini Ranjit, Courtney Byrd-Williams, Susan Carey Dabney, Christine Jovanovic

Purpose:

Parent Teacher Associations (PTAs) are organizations that provide parent support for schools. PTA Healthy Lifestyles Chairs (HLCs), positions on the campus PTA that support school health policy implementation, can potentially increase parent engagement in obesity prevention initiatives; however, data describing their activities or outcomes are lacking. This presentation provides pilot data on implementation of PTA HLC in Texas.

Methods:

In 2009-2010, the Texas Education Agency obtained data on health education from school districts in Texas, USA, via a self-administered survey. These data were tabulated to determine HLC activities in schools. Structured interviews (n = 11) were conducted with HLCs from elementary, middle and high schools (n = 7, 3, and 1, respectively) to document activities, materials used, program barriers and perceived outcomes.

Results:

Over 200 (n=202) school districts reported HLCs at >1 school campuses; 735 school districts reported no HLC, and 119 districts did not respond. HLCs were relatively new, but received positive responses from parents, teachers, and students. Reported barriers included: Unhealthy cafeteria food; negative attitudes; poor guidance; low participation; schedule conflicts; and lack of time. Most respondents reported that funding was low, inconsistent or non-existent, and that few HLC materials were available. Accomplishments include Family Fun Nights, school gardening programs, healthy lifestyle newsletters, and Walk Across Texas. Overall, the PTA HLCs perceived that their actions improved student health, and made a positive difference at the school.

Conclusions:

Initial data suggest that the PTA HLC model may be a promising method of enhancing parent engagement in school health programs.

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S41

Evaluating environments for obesity prevention: The U.S. IOMs Evaluating Obesity Prevention Efforts: A plan for measuring progress report & international comparisons

Moderator: Lawrence Green, School of Medicine, University of California, San Francisco, CA, USA

Presenters: Deanna Hoelscher, Lawrence Green, Lorrene Ritchie, Heather Manson

Discussant: Lawrence Green, School of Medicine, University of California, San Francisco, CA, USA

Purpose:

The purpose of this symposium is to present an overview and rationale of the 2013 U.S. Institute of Medicine (IOM) report Evaluating Obesity Prevention Efforts: A Plan for Measuring Progress. This report will be compared to similar evaluation and monitoring efforts in Ontario, Canada and through the World Health Organization (WHO).

Rationale:

In 2012, the IOM released a landmark report, Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation (APOP). Specific and concrete action steps for reversing the obesity epidemic were recommended for five environments: Physical activity; food and beverages; messaging; health care and worksites; and schools. A sequel report, Evaluating Obesity Prevention Efforts (EPOP), was released in late 2013 to measure and inform progress in obesity prevention—in both actions and outcomes. Measuring progress depends on describing the current status or movement of obesity and its determinants such as behaviors, environments, and policies (assessment and surveillance) as well as assessing the implementation (monitoring) and effectiveness of obesity prevention programs and initiatives to learn more about what works (summative evaluation).

Objectives:

1. Summarize the background, framework, and indicators from EPOP.
2. Describe the components of a National Evaluation Plan, community assessment, and the development of a Community Evaluation Plan based on EPOP.
3. Compare and contrast EPOP with monitoring and evaluation efforts in Ontario, Canada.

Summary:

Progress in obesity prevention depends on informed action. The goal of the IOM report, Evaluating Obesity Prevention Efforts, is to offer a framework and plans for measuring progress and identifying effective actions for national and community evaluation of progress in obesity prevention. The tasks accomplished in the report are:

1. Drawing on the recommendations and recommended indicators of progress from the preceding IOM report—APOP—this report considers tools and metrics to measure progress; and develops a plan for a national level evaluation of obesity prevention efforts by sector; and

2. Develops a community-level measurement plan that adds detail and support to the national-level evaluation plan.

Also shared will be evaluation recommendations for taking action to advance progress in obesity prevention and reduce disparities. In particular, the use of the WHO Framework for Evaluation and Monitoring Implementation of the WHO Strategy will be highlighted, as well as a current initiative from Ontario, Canada that has independently developed an evaluation plan for the its obesity prevention initiative.

S41.1

How should we evaluate the IOM's Accelerating Progress in Obesity Prevention report? Overview of the 2013 IOM evaluating obesity prevention efforts: A plan for measuring progress report

Author:

Lorrene Ritchie

Purpose:

Progress in obesity prevention depends on informed action. The goal of the 2013 IOM report, Evaluating Obesity Prevention Efforts, is to offer a framework and plans for measuring progress and identifying effective actions for national and community evaluation of progress in obesity prevention.

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Methods:

Drawing on the recommendations and recommended indicators of progress from the preceding IOM committee and report, *Accelerating Progress in Obesity Prevention*, this report considers currently used and new tools and metrics to measure progress; and develops a plan for a national level evaluation of obesity prevention efforts by sector and, as appropriate, across sectors. The report also develops a community-level measurement plan that adds detail and support to the national-level evaluation plan.

Results:

The *Evaluating Obesity Prevention Efforts* report recommends a National Obesity Evaluation Plan, a Community Obesity Evaluation Plan, and identifies actions to improve current approaches for collecting data and creating indicators of progress on these obesity prevention efforts, increasing workforce capacity, and improving health equity.

Conclusions:

The recommendations made in this report focus on efforts to increase the likelihood that actions taken to prevent obesity will be implemented and monitored, their progress can be tracked nationally and regionally through surveillance systems, and their impact evaluated down to the community level, and that the most promising practices will be widely disseminated and used.

S41.2**Evaluating obesity prevention efforts: A U.S. national plan for evaluating progress****Author:**

Deanna Hoelshler

Purpose:

The many initiatives that have targeted obesity prevention monitoring and evaluation within and across sectors and levels from national to community are incomplete and have yet to be harmonized. Without coordinated evaluation, progress will be uneven and unnoticed and the opportunity will be missed either to correct the efforts toward obesity control or to build on relative successes.

Methods:

The *Evaluating Obesity Prevention Efforts* report develops a plan for a national level evaluation of obesity prevention efforts by sector and, as appropriate, across sectors.

Results:

Currently the U.S. does not have a nationwide evaluation plan for obesity prevention. The committee recommends a National Obesity Evaluation Plan that provides a framework for planning, implementing, and evaluating the results of obesity prevention-related policies and programs at the national level. Recommendations for implementation of the national plan include aspects of leadership, coordination of surveillance systems for data collection, infrastructure to build capacity for conducting evaluations, and feedback mechanisms for the data collected.

Conclusions:

A National Obesity Evaluation Plan is a framework for evaluating progress in achieving the strategies recommended in the APOP report at a national level and serves as a model, template, or framework for state and regional evaluations.

S41.3**Evaluating obesity prevention efforts: A community plan for evaluating progress****Author:**

Lawrence Green

Purpose:

Substantial investments are being made by communities across the nation in obesity prevention efforts. To learn from these local-level efforts and inform future action, it is critical to understand the implementation, impact and value

of these investments. Yet, there is little harmonization of evaluation efforts, making it challenging to determine what actually works under varied circumstances. Communities also differ widely with respect to intervention and evaluation resources and capacity.

Methods:

The Evaluating Obesity Prevention Efforts report develops a community-level plan that adds detail and support to the national-level evaluation plan. The community plan is a template to guide communities in describing the current status of and trends in obesity and its determinants locally (Assessment). It also guides communities to measure implementation of interventions (Monitoring) as well as evaluate long-term outcomes and population impacts on behavior change, prevalence of obesity, and health (Summative Evaluation).

Results:

The IOM committee recommends a Community Obesity Evaluation Plan for customizing plans for evaluating efforts, including the identification and use of a set of common indicators to assess progress of efforts across and within multiple environments and to describe population-level behavioral and obesity impacts; and use of appropriate evaluation designs, analytic methods, and approaches to sharing and visualizing data and findings.

Conclusions:

This report provides guidance for communities that are implementing or intend to implement obesity prevention interventions. The guidance, in the form of the Community Obesity Evaluation Plan, provides an actionable framework for evaluation at the community level that can be adapted for local needs and resources, while also providing for use of common measures that will allow for comparisons across settings, types of policies, programs and jurisdictions.

S41.4**Evaluation in International perspective: Evaluation of Ontario, Canada obesity prevention efforts and comparison with international efforts****Author:**

Heather Manson

Purpose:

The government of Ontario, Canada has committed to reduce childhood obesity by 20% over 5 years. To inform these efforts, Public Health Ontario (PHO) developed an Evidence Review Framework based on APOP to synthesize the evidence guiding action for childhood obesity reduction in Ontario, and EPOP as a framework for evaluation. These were subsequently adapted to an international program based on the French EPODE program model, called the Ontario Healthy Kids Community Challenge.

Methods:

We reviewed IPOP, EPOP and evaluations of previous EPODE and other community-based interventions. We considered how EPODE had been adapted to the Ontario context and the infrastructure to measure progress. Our evaluation plan considers the challenges of evaluation when complex international interventions are adapted for new contexts.

Results:

The Healthy Kids Community Challenge will be implemented in thirty communities across Ontario. Our evaluation will describe the impact of the Ontario's obesity prevention efforts at child, family, and community levels. The evaluation will also explore program theory and implementation and the program's adaptation and application in Ontario. Data collection activities and indicators are specified across participating communities with centralized analysis and reporting. Opportunities for community engagement and learning are under development. Ontario strengths and challenges in the evaluation of a complex adapted obesity reduction intervention will be described.

Conclusions:

An evaluation framework has been developed for Ontario within an international framework for developing and mounting community program plans. While there are many activities underway that may impact childhood obesity, greater collective focus, including for an infrastructure for monitoring and evaluation, is required to achieve outcomes.

ORALS

Orals O1

Motivation Towards Health Behavior

Moderator: Pier-Eric Chamberland

Affiliation: University of Quebec in Trois-Rivieres, Trois-Rivieres, Canada

O01.1

We are what we repeatedly do: How physical activity habit and integrated motivation promote and sustain each

Authors:

Pier-Eric Chamberland, Paule Miquelon, Felix Veillette

Purpose:

Autonomous motivation was recently shown to promote exercise habit formation (Hashim, Golok & Ali, 2011; Gardner & Lally, 2012; Chamberland & Miquelon, 2013). In turn, repetitive action is known to foster internalization of behavior into the self-concept (Charng, Piliavin, & Callero, 1988), i.e. integrated motivation (Ryan & Deci, 2012). Given internalized motives become chronically accessible but may also reflect automatic tendencies (McLachlan & Hagger, 2011; Danner, Aarts, & deVries, 2008), two studies were conducted to investigate the dynamic relationship between exercise habit and integrated motivation.

Methods:

In a first study, three waves of data collected over three months from 984 adults that completed measures of exercise habit (Chamberland, Miquelon & Dumont, 2012), integrated motivation (McLachlan, Spray & Hagger, 2011) and intrinsic motivation (Markland & Tobin, 2004) were analyzed with panel modeling. In a second study, similar measures collected twice over two months from 516 active adults were analyzed with structural equation modeling.

Results:

Study 1: habit (t2) significantly predicted integrated motivation (t3) ($\beta=.21$, $p<.01$) once t1 levels were controlled, as well as intrinsic motivation ($\beta=.05$, $p=.04$). Study 2: integrated motivation (t1) directly predicted habit (t2) ($\beta=.11$, $p=.03$) above and beyond intrinsic motivation and habit at t1, while intrinsic motivation effects on habit (t2) were completely mediated by habit at t1.

Conclusions:

Results suggest that integrated motivation is acquired through habit formation, and subsequently sustains habit over time. Further studies should investigate to what extent may integrated motivation provide additional strength to one of habit's defining features, resistance to change.

O01.2

How does motivational interviewing's work? A systematic review of potential mechanisms of action based on self-determination theory

Authors:

Jennifer La Guardia, Pedro Teixeira, Marta Marques

Purpose:

Motivational Interviewing (MI) is becoming widely used in health interventions, yet there is significant variability in its effects. Self-Determination Theory (SDT) provides an empirically supported framework to explain the mechanisms of MI's efficacy. This study reports a systematic review of the effects of MI interventions on SDT-based psychological mechanisms underlying behavior change.

Methods:

Electronic databases and MI meta-analyses were searched and articles were selected for review if they 1) used MI or motivational enhancement therapy (MET), 2) measured SDT needs (autonomy, competence, relatedness) or self-regulation constructs (autonomous or controlled motivation), and 3) targeted health behavior changes to diet, physical

activity, weight loss, or smoking cessation. There were no restrictions on study design. Quality and content of studies were analyzed and summarized.

Results:

The search yielded 1886 publications, with 236 retrieved for full text review and 78 retained. Extracted studies targeted weight control, exercise, fruit and vegetable intake, and smoking cessation, with mode (e.g., in-person) and intensity of delivery (e.g., number of sessions) of MI varying substantially. The majority of eligible studies examined MI's effects on client self-efficacy and showed mixed results, with few studies examining autonomy or relatedness. Overall MI helped clients develop greater autonomous motivation for the target behavior.

Conclusions:

Having a theoretical framework such as SDT provides a coherent structure to explain why and how MI works. Results support the effect of MI interventions on autonomous motivation while findings for basic psychological need satisfaction are less consistent. Results are discussed in relation to current efficacy of MI.

O01.3**A self-determination theory approach to adults' healthy body weight motivation: A longitudinal study focusing on food choices and recreational physical activity****Authors:**

Christina Hartmann, Simone Dohle, Michael Siegrist

Purpose:

Different types of motivation to maintain or achieve a healthy body weight were assessed on population level. The different types of motivation were based on Self-Determination Theory and we explored their predictive potential on changes in physical activity (PA) participation and food choices.

Methods:

Participants of the Swiss Food Panel (N=2919, 46%) completed a paper-and pencil questionnaire in 2012 (T1) and 2013 (T2) assessing consumption frequency of different foods, recreational PA levels, and participants' motivation for a healthy body weight (autonomous, introjected, external regulation). A set of multiple regression analyses was conducted with the types of motivation at T1 as predictors for changes in food consumption and recreational PA at T2.

Results:

Autonomous regulation at T1 was the only type of motivation that predicted positive changes in food choices, and was also linked to higher participation in moderate and vigorous recreational PA in men, but not in women. Introjected regulation was not associated with food choices in both genders, but was a significant predictor for vigorous, but not moderate, recreational PA participation at T2 in women. External regulation predicted negative changes in food choices one year later, and no association between external regulation and PA participation was found.

Conclusions:

Autonomous goal setting for a healthy body weight seems to be substantial in the establishment of recreational PA participation or balanced food choices. A more controlling social environment accompanied by pressure to change behavior is no beneficial condition for dietary improvements or PA participation.

O01.4**Stirring in the motivational soup: A latent profile analysis of self-determined motivation in exercise****Authors:**

Magnus Lindwall, Heather Patrick, Pedro Teixeira

Purpose:

To identify and describe latent classes (profiles) of self-determined motivation in exercise (SDME) and examine how psychological need-satisfaction in exercise and exercise behavior relate to these latent classes.

Methods:

We used person-centered analyses (latent profile analysis, LPA) through Mplus 7.1 to identify latent classes of SDME in a sample of Swedish adult (age mean 45.0, SD: 11.7) members of an internet-based exercise program (N=1091). Main analyses were based on scores of the five subscales of the Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2). Basic psychological need satisfaction in exercise (measured through BPNES) and exercise behavior (measured through LTEQ) were used to validate and predict latent class membership of SDME.

Results:

Four classes of SDME were derived. Class 1 (n=749, 68.8%) was characterized by low controlled regulation (CM) and high autonomous motivation (AM). Class 2 (n=242, 22.2%) also show low CM but moderate AM, whereas class 3 (n=85, 7.8%) had moderate CM and moderate AM. The small class 4 (n=13, 1.2%) had high CR and low AM. Need satisfaction and exercise both predicted SDME class membership. Class 1 exercised more regularly and had higher need satisfaction compared to the other classes.

Conclusions:

Person-centered analyses, such as LPA, may offer a valuable tool when examining complex motivational patterns and their relation to exercise behavior.

Orals 02

Correlates of PA in Children

Moderator: Jenny Veitch

Affiliation: Deakin University, Burwood, Australia

002.1

Associations of objectively assessed parental physical activity with their child's physical activity: A cross-sectional study of families with 5-6 year old children

Authors:

Russell Jago, Simon Sebire, Lesley Wood

Purpose:

The study examined if there were associations between the physical activity (PA) of parents and their 5-6 year old children.

Methods:

Data are from the B-ProAct1v cross-sectional study. Pupils and their parents were recruited from 63 primary schools. Multivariable linear regression models were used to examine the extent to which parental time spent in accelerometer assessed moderate to vigorous intensity physical activity (MVPA) was associated with children's time spent in MVPA. Logistic regression models were then used to assess whether parental compliance with PA guidelines was associated with children's compliance with PA guidelines.

Results:

The sample comprised 512 male parents, 838 female parents, 533 boys and 490 girls. Eighty-three percent of males, 80% of females, 70% of boys, and 54% of girls met PA guidelines. Parental time spent in MVPA was weakly associated their children's time spent in MVPA. Maternal physical activity levels were associated with child physical activity with each additional 10 minutes of MVPA done by the mother being associated with an additional minute of child MVPA. Children were 84% and 62% more likely to meet PA recommendations if the male or female parent respectively met the adult guidelines. There was no evidence of a child gender difference in the association between the PA patterns of parents and children.

Conclusions:

There were consistent but weak associations between the MVPA of children and their parents. Findings suggest that targeting parental MVPA as a means of positively affecting child physical activity is unlikely to yield important effects.

002.2

Weekday and weekend physical activity in differentially active children

Authors:

Kelly Mackintosh, Lynne Boddy, Alexandra Valencia-Peris, Elena Ramirez-Rico, Stuart Fairclough

Purpose:

To investigate whether weekday-weekend differences in physical activity (PA) intensities exist among children categorised by their activity levels.

Methods:

Seven-day accelerometer data were obtained from 810 children ($n = 420$ girls) aged 10-11 years. Stature and body mass were measured using standard procedures. BMI z-scores were subsequently calculated and indices of multiple deprivation (IMD) scores were determined from home postcodes. Time spent in moderate-to-vigorous physical activity (MVPA) were calculated. Sex-specific MVPA quartile cut-off values categorised boys and girls separately into four graded groups representing the least (Q1) through to the most active (Q4) children. Sex- and activity quartile-specific multilevel linear regression models, controlling for BMI z-scores and IMD scores, analysed differences in moderate PA, vigorous PA, and MVPA between weekdays and weekends.

Results:

On weekdays, Q1 (6.6 min•d⁻¹; $p < .001$) and Q2 boys (7.3 min•d⁻¹; $p < .01$) did significantly more MPA and Q1-Q3 boys accumulated significantly more VPA and MVPA than at weekends. There were no significant differences in weekday and weekend MPA, VPA, and MVPA for Q4 boys. On weekdays, Q1 and Q2 girls did significantly more MPA ($p < .05$) and Q1-Q3 girls engaged in 3.9-5.1 min•d⁻¹ more VPA ($p < .05$) and 6.4-9.1 min•d⁻¹ more MVPA ($p < .01$) than at weekends. Q4 girls spent less weekday time in MPA and MVPA compared to weekends.

Conclusions:

The most active children maintained their PA levels at weekends, while less active peers demonstrated a decline in weekend PA at all intensities. Less active children may benefit most from weekend intervention strategies.

002.3

“I just couldn’t be bothered”: Understanding factors influencing students’ engagement in after-school sport programmes

Authors:

Toni Hilland, Nicola Ridgers, Gareth Stratton, Stuart Fairclough

Purpose:

The primary purpose of this study was to explore and understand school-aged children’s physical activity participation outside of school Physical Education (PE).

Methods:

Twelve in-depth focus group interviews were conducted in three secondary schools in the North West of England. Fifty-four students (38 girls; aged 12-14 years) were purposefully selected to participate in this study, based on their teachers’ normative ratings of their PE ability. Therefore, four groups from each school, comprising between 4-5 students, took part in this qualitative study. Focus group topics were developed from Welk’s (1999) Youth Physical Activity Promotion Model. Interviews lasted between 30-60 minutes; the discussions were recorded by dictaphone and later transcribed verbatim. Analysis was carried out using NVIVO and thematic analysis was employed to interpret the data. The project received institutional ethics committee approval.

Results:

Analyses revealed a huge range of activities and opportunities were referred to when discussing physical activity outside of school PE. For example lunchtime clubs, after school clubs, intra- and inter-school competitions. The above

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average students detailed their experiences in inter-school sport and competitions, describing how they loved the competition, the social aspect of playing with friends and being supported and encouraged by family and their PE teachers.

Conclusions:

Another key theme to emerge from the interviews involved students' lack of motivation and 'can't be bothered' attitude, compared to their earlier years in school.

002.4

Perceptions of empowering and disempowering coach created climates as predictors of objectively measured daily physical activity and sedentary time in youth sport participants

Authors:

Sally Fenton, Joan Duda, Timothy Barrett

Purpose:

Grounded in self-determination theory (Deci and Ryan, 2000) and achievement goal theory (Ames, 1992, Nicholls, 1989) this study tested a hypothesised model linking perceptions of the coach-created motivational climate within youth sport (i.e., empowering and disempowering dimensions; Duda, 2013), to motivation regulations and objectively measured daily moderate-to-vigorous physical activity (MVPA) and sedentary time (ST).

Methods:

91 male grassroots footballers (Mage = 11.65, SD = 1.50) completed a multi-section questionnaire assessing their perceptions of features of the coach-created motivational climate which reflect higher-order empowering and disempowering dimensions, and autonomous and controlled motivation towards football participation. Physical activity was recorded over seven days via accelerometer (GT3X). Average daily MVPA and ST were determined.

Results:

Path analysis supported a model ($\chi^2 (18) = 28.87$, CFI = .95, RMSEA = .08) in which players' perceptions of an empowering climate positively predicted autonomous motivation ($B = .42$, $p < .01$), which in turn, was positively related to daily MVPA ($B = .29$, $p < .01$) and negatively associated with ST ($B = -.21$, $p < .01$). Perceptions of a disempowering climate positively predicted controlled motivation ($B = -.39$, $p < .01$), which in turn, was positively related to ST ($B = -.14$, $p < .01$).

Conclusions:

Players who perceive their coaching environment to be more empowering are likely to engage in more MVPA and less ST per day. The development of theory-based interventions to foster empowering coaching and enhance autonomous reasons for engagement present an avenue through which PA levels of young people can be increased towards the prevention of obesity.

Orals 03

Health Behaviors During Pregnancy and Early Motherhood

Moderator: Ellinor Olander

Affiliation: City University London, London, UK

003.1

Which behavior change techniques are associated with physical activity behavior in pregnant women? A systematic review and meta-analysis

Authors:

Ellinor Olander, Lou Atkinson, David French

Purpose:

Despite numerous benefits associated with physical activity (PA) during pregnancy, most pregnant women decrease their PA behavior. Previous reviews have identified what behavior change techniques (BCTs) are associated with PA, but have excluded pregnant women. The aim of this review was to identify which BCTs are associated with PA behavior during pregnancy.

Methods:

A search of six databases identified 24 controlled trials reporting PA behavior. Included interventions had to measure PA at least twice in pregnancy. Studies without a control group were excluded. All intervention descriptions were coded with the 40 item CALO-RE taxonomy of BCTs. Meta-analysis and moderator analyses were conducted to examine the association across studies between the presence or absence of specific BCTs within interventions and changes in PA behavior.

Results:

The overall effect size for intervention effects was $d = 0.41$. Sixteen BCTs were identified in the included interventions, of which ten were associated with a decreased level of PA. Two BCTs ('prompt self-monitoring of behavioral outcome' and 'provide instruction on how to perform the behavior') were associated with a higher level of PA compared to when these BCTs were not included in the intervention.

Conclusions:

These findings suggest that interventions should include practical elements such as instructing women how to be active and encourage self-monitoring of the outcomes of their PA (for example weight). These results also suggest that caution may be needed in applying BCTs that are associated with PA behavior in non-pregnant adults as they may be less suitable for pregnant women.

003.2

Weight management in pregnancy: Participants' experiences of 'Healthy Eating and Lifestyle in Pregnancy (HELP)' trial

Authors:

Dunla Cassidy, Lauren Copeland, Elinor John, Yvonne Moriarty, Karen Jewell, Sharon Simpson

Purpose:

Around 1 in 5 pregnant women in the UK are obese. Obesity is linked to poor health and pregnancy complications. We developed and tested in a cluster RCT a theory-driven group-based intervention for obese pregnant women that was facilitated by midwives and slimming world consultants. It was designed to support women during pregnancy to moderate weight gain and reduce BMI one year after birth, in addition to targeting secondary health and wellbeing outcomes. This paper aims to explore participants' experiences of engaging in the 'HELP' trial and provide insight into receipt of the intervention and study processes.

Methods:

62 women took part in semi-structured telephone interviews. Participants were sampled across 20 centres; by treatment, weight change and group attendance. Data was collected at two time-points; 6 months and 1 year post-birth, and analysed using thematic analysis.

Results:

Accounts offered insights into the group environment, the importance of social support and the value of facilitators' involvement. Reasons for compliance were highlighted, with discussion on aspects that encouraged women to change diet and activity behaviors, barriers to engaging with the intervention, and researcher influence in control sites. Participants' emphasised the benefits of attending the group sessions where they obtained knowledge, support and skills in relation to weight and pregnancy.

Conclusions:

Engaging in the intervention can help women to adopt healthier habits leading to avoidance of excess weight gain during pregnancy and better outcomes for mother, baby and the wider family. Participant accounts' will facilitate interpretation of the main study findings.

O03.3**A pragmatic randomised controlled trial to evaluate the effectiveness of exercise as a treatment for postnatal depression: The PAM-PeRS trial****Authors:**

Amanda Daley, Ruth Blamey, Kate Jolly, Andrea Roalfe, Mary McGuinness, Ian Jones, Debbie Sharp, Christine MacArthur

Purpose:

The purpose of the study was to investigate the effectiveness of exercise as an adjunctive treatment for postnatal depression.

Methods:

94 women who fulfilled ICD-10 criteria for major depression (by clinical interview assessment) in the first six postnatal months were recruited and randomised to usual care plus an exercise intervention or usual care only. The primary outcome was symptoms of depression using the Edinburgh Postnatal Depression Scale (EPDS) at six month post randomisation. Secondary outcomes included EPDS score as a binary variable (recovered and improved), social support and physical activity at six and 12 month post-randomisation.

Results:

146 women were eligible and 94 were randomised. 34% reported thoughts of self harm at baseline. After adjusting for baseline EPDS, analyses revealed a -2.04 mean difference in EPDS score, favouring the exercise group (95% CI: -4.11 to 0.03, $p=0.05$). When also adjusting for pre specified demographics the effect was larger and statistically significant (mean difference= -2.26, 95% CI: -4.36 to -0.16, $p=0.03$). Based on EPDS score a larger proportion of the intervention group were recovered (46.5% versus 23.8%, $p=0.03$) compared with usual care at six months follow up.

Conclusions:

This trial contributes new evidence to indicate exercise is likely to be an effective adjunctive treatment for postnatal depression.

O03.4**Promoting physical activity behaviors in mothers with young children: A randomised controlled trial****Authors:**

Jonine Jancey, Sarojini Monteiro, Peter Howat, Satvinda Dhaliwal, Sharyn Burns, Andrew Hills, Annie Anderson

Purpose:

Increasing levels of physical activity in mothers has long-term health benefits for the mother and the family. This study aimed to evaluate the effect of a six-month, physical activity randomised controlled trial for mothers' of young children.

Methods:

Women were recruited via playgroups and randomly assigned to a primarily home-based intervention ($n=394$) or control group ($n=322$). The intervention group received a 6-month intervention program that was delivered via playgroups in Perth, the capital of Western Australia. Physical activity was assessed using the International Physical Activity Questionnaire and muscle strength exercise questions were based on the American Heart Association guidelines. Outcome measures included mean minutes per week (min/week) of moderate (M) and vigorous (V) intensity physical activity (PA), and number of days/week of muscle strength exercises.

Results:

The intervention had a significant effect on the mean time for vigorous ($p=0.008$), moderate ($p=0.023$) and total physical activity ($p=0.001$) when compared to the control group. The intervention group increased their vigorous activity by a mean of 24 minutes/week, moderate activity by 23 minutes/week and total physical activity by 72 minutes/week. The number of days that participants completed muscle strength exercises did not increase during the intervention.

Conclusions:

A home based intervention was able to demonstrate statistically significant improvements in physical activity in a hard to reach target group. These changes if maintained over a longer period are likely to improve the health of mothers and have a positive impact on that of their partners and children.

Orals 04 Television Exposure

Moderator: Katrien De Cocker

Affiliation: Ghent University, Ghent, Belgium

004.1

Educational inequalities in TV viewing among older adults: A mediation analysis of ecological factors

Authors:

Katrien De Cocker, Ilse De Bourdeaudhuij, Megan Teychenne, Sarah McNaughton, Jo Salmon

Purpose:

No previous studies have examined the underlying mechanisms explaining educational inequalities in TV viewing in older adults. Thus the aim of this study was to examine the potential mediating role of personal, social and physical environmental factors in the relationship between education and TV viewing among Australian 55-65 year-old adults.

Methods:

In 2010, self-reported data was collected among 4,082 adults (60.2 (3.2) years; 48% men) across urban and rural areas of Victoria, for the Wellbeing, Eating and Exercise for a Long Life (WELL) study. The mediating role of personal (body mass index [BMI], quality of life), social environmental (proximal level = social support from family and friends, social participation; and distal level = interpersonal trust, social cohesion, personal safety) and physical environmental (neighbourhood aesthetics, neighbourhood physical activity environment, number of televisions) factors in the association between education and TV viewing time was examined using MacKinnon's product of coefficients test based on multilevel linear regression analyses (conducted in 2012).

Results:

Multiple mediating analyses showed that BMI ($p\leq 0.01$; 4.5% mediation), personal safety ($p\leq 0.001$; 3.1% mediation), neighbourhood aesthetics ($p\leq 0.01$; 1.5% mediation) and number of televisions ($p\leq 0.01$; 3.0% mediation) partly explained the educational inequalities in older adult's TV viewing. No proximal social factors mediated the education-TV viewing association.

Conclusions:

Interventions aimed to reduce TV viewing in less educated older adults should target both personal (e.g. BMI) and social factors at the distal level (e.g. personal safety) as well as physical environmental factors (e.g. neighbourhood aesthetics, number of televisions).

004.2

Does early childhood screen time predict poorer wellbeing?

Authors:

Trina Hinkley, Vera Verbestel, Ilse de Bourdeaudhuij, Wolfgang Ahrens, on behalf of the IDEFICS Consortium

Purpose:

Emerging literature shows that screen time during early childhood may be detrimental to children's health and development. However, little is known about how screen time may be associated with children's wellbeing. The purpose of this study was to investigate possible dose-response associations of young children's screen time with their later wellbeing.

Methods:

IDEFICS is a prospective cohort study with an intervention component. Data were collected in 2007/2008 and 2009/2010. Participants were 3604 children from eight EU countries aged between two and six years who participated in the longitudinal component of the IDEFICS study only and not in the intervention. In total, six indicators of wellbeing from two validated instruments were used as outcomes at follow-up: Peer problems and emotional problems from the SDQ; emotional wellbeing, self-esteem, family functioning and social networks from the KINDL. Each scale was dichotomized to identify those children at risk of poorer outcomes. Indicators of screen time (week and weekend day TV and computer use) from baseline were used as predictors.

Results:

Associations varied between boys and girls; however were all in the expected direction. TV viewing, either week or weekend day, was more consistently associated with outcomes than computer use. Across associations, children were at between 1.2 and 2.0 times increased risk of adverse outcomes for emotional problems and family functioning for each additional hour of TV or computer use, depending on the outcome.

Conclusions:

Early childhood screen time is associated with some indicators of wellbeing. Further research is required to identify potential mechanisms.

004.3

TV viewing time is associated with higher cancer incidence

Authors:

Nico Rizzo

Purpose:

A number of studies have found correlations between physical activity and certain cancers. However, few studies have investigated the association between sedentary behavior and cancer incidence. To investigate the association between TV viewing time as a marker of sedentary behavior and cancer incidence.

Methods:

Prospective study of 64777 subjects (age at baseline 58 [SD±14] years) from the Adventist Health Study-2 in the contiguous U.S. Mean follow up time for all subjects was 3.8 [SD±1.5] years. 2286 incident cancer cases were identified. TV watching time was used as a marker of sedentary behavior and was stratified into: ≤1 hour/day, 2 hours/day and ≥3 hours/day. Cox-proportional hazard regression analysis was performed to estimate hazard ratios (HR) with adjustments made for age, sex, race, physical activity, BMI, smoking, alcohol intake and other relevant factors. In women additional adjustments were made for previous pregnancies, menopausal status, hormone replacement therapy and oral contraceptives. Sex stratified analysis was repeated for typical female and male cancers.

Results:

Multivariate HR for all cancers was highest in those watching TV ≥3 hours/day (HR=1.24; 95%CI: 1.12-1.38) and intermediate for those watching TV 2 hours/day (HR=1.17; 95%CI: 1.06-1.30) when compared with subjects watching ≤1

hour/day. Similar results were seen with female cancers where HR was highest in those watching TV ≥ 3 hours/day (HR=1.23; 95%CI:1.00-1.51) but remained below significance levels for those watching TV 2 hours/day.

Conclusions:

The findings suggest that watching TV for extended hours per day may pose an independent risk in developing cancer and is of public health relevance.

O04.4

Is TV-exposure in the home related to healthfulness of child requests in the grocery store?

Authors:

Eric Calloway, Maria Romo, Katie McInnis, Cindy Roberts-Gray, Sara Sweitzer, Margaret Briley

Purpose:

Child TV-exposure has a well-established association with child overweight and poor dietary preferences. However, in-home TV-exposure's relationship with child food-request behavior in the grocery store has not been well studied. Children influence about 1/3rd of family food purchasing by making requests and preschool-aged children make more requests than older children. This study examined the relationship between preschool-child TV exposure and healthfulness of food-requests in the grocery store. Hypothesis: high in-home TV-exposure will be associated with a high frequency of unhealthy requests in the grocery store.

Methods:

Parent-child dyads, with children aged 2-6 years, were recruited at preschools. Parents completed a questionnaire and the dyads were met at their usual grocery store and shopping time. Prior to shopping, the child was affixed with a micro-camcorder. Child unhealthy (i.e., sugar sweetened beverage and snack food) requests/minute of shopping time and four parent-reported in-home child TV-exposure measures were assessed. Kruskal-Wallis one-way analysis of variance was used to assess differences between groups of TV-exposure (Low/No, Medium, High).

Results:

Children (n=32) showed no relationship between unhealthy requests/min (Median=0.051, 0-0.200) and TV-hours/day (H=2.428, df=2, p=0.30), frequency of eating in-front-of TV (H=0.569, df=2, p=0.75), TV as reward (H=0.485, df=2, p=0.78), or amount of TVs/home (H=0.198, df=2, p=0.91). Pairwise correlations similarly showed no significant relationships.

Conclusions:

Though more investigation is needed, these findings suggest that reducing child in-home TV-exposure may not be an effective intervention target for family-based interventions aiming to improve the healthfulness of young child in-store food requests.

Orals 05

Environmental Correlates of Health Behaviors in Children and Adolescents

Moderator: Tarun Katapally

Affiliation: University of Saskatchewan, Saskatoon, Saskatchewan, Canada

O05.1

From evidence to evaluation: Combining WHO physical activity guidelines with active living research to develop age-specific activity profiles

Authors:

Tarun Katapally, Nazeem Muhajarine

Purpose:

To combine existing and evolving active living evidence to develop age-specific activity profiles for advancing the standardization of active living evaluation outcomes.

Methods:

Saskatoon's neighbourhood built environment was assessed by two replicable observation tools in 2009 (www.smart-citieshealthykids.com). Neighbourhood socioeconomic variables were derived from 2010 G5 Census projections. In 2010, after obtaining individual and household data, accelerometers were used to obtain activity data from 455 children. During accelerometer deployment, height and weight were measured to determine weight status. These data were used to generate daily thresholds for sedentary behavior (SED) similar to age-specific, World Health Organization physical activity (PA) guidelines. Utilizing these thresholds, daily SED and PA were dichotomized. Thereafter, with dichotomized SED and PA as separate outcome variables, and with neighbourhood, individual and household factors as predictors, multilevel logistic regression models were used to develop activity profiles: Active/inactive and sedentary/non-sedentary.

Results:

A complex set of factors including denser built environment, positive peer relationships and consistent parental support increased the likelihood of children being profiled as active. These factors did not decrease the likelihood of children being profiled as sedentary; however, descriptive analysis depicted a high SED in children irrespective of them being active or inactive.

Conclusions:

Activity profiles' generation enabled a holistic picture of environmental influence on the interplay between two distinct, yet related behaviors □ SED and PA. Evidence-based activity profiles facilitate standardization of active living evaluation outcomes that can be used to quantify the impact of interventions and create a uniform platform to compare results across interventions.

O05.2**The modification of a home assessment tool for rural families with young children****Authors:**

Alexandra C. Burdell, Laura L. Bellows, Susan L. Johnson, Patricia L. Davies, William J. Gavin, Richard E. Boles

Purpose:

The physical home environment has been linked with health behaviors and outcomes. Home environment instruments have rarely been psychometrically tested with families of geographical and economic diversity. This project aimed to modify and psychometrically test a home environment instrument with diverse families.

Methods:

Rural families of children attending preschool participated in separate qualitative (n=11) and quantitative (n=26) studies. The modified Home IDEA (Inventory Describing Eating and Activity) is a self-report questionnaire for the physical home environment for food and activity items, including 110 food/drinks, 17 physical activity (PA) devices, and 9 sedentary devices. Face-to-face home interviews were conducted to inform instrument design and function while home assessments (parent and trained independent raters) completed the modified Home IDEA for psychometric validation.

Results:

Qualitative home interviews identified a need for clearer instructions; more detailed description and reorganization of foods; and reduction of items (159 to 136). Reliability testing of the modified assessment resulted in Kappa Statistics that were high (0.6-1.00) for 96 items (71 food, 16 PA, 8 sedentary), moderate (0.4-0.55) for 28 items (27 food, 1 PA), and poor for 13 items (<0.39) (12 food, 1 sedentary). Overall reliability improved from 53% for original items to 71% for modified items.

Conclusions:

Using multi-method, multi-informant methods, the psychometric properties for the Home IDEA were established with rural families of preschool-aged children. Based on rigorous tool development methods, our findings fill a significant gap in the literature by providing a measurement tool for the home food and activity environment for diverse families.

O05.3

Trajectories of objectively measured sedentary behavior among secondary students in Canada in the context of a province-wide physical education policy: A longitudinal analysis

Authors:

Erin Hobin

Purpose:

Higher levels of sedentary behavior have been linked to childhood obesity. In 2008, Manitoba introduced a province-wide policy mandating physical education (PE) each year in grades 9 through 12 for the first time in Canada. The objective of this study was to examine the longitudinal changes in and the factors associated with the sedentary behavior trajectories of adolescents in Manitoba during their tenure as secondary school students in the context of this PE policy.

Methods:

Using a time-series design, 723 students from 32 secondary schools in Manitoba were recruited prior to policy implementation (T0) and were followed-up until grade 12 (T1 to T3). At each time point, students' mean daily minutes of sedentary behavior were measured by accelerometers and student factors were self-reported. Growth curve models will be used to examine the trajectories of sedentary behavior and to determine the influence of student factors, including demographics, physical activity levels, and the social environment.

Results:

At baseline, students' mean daily sedentary behavior totaled 9.25 hours. Three years after the policy was implemented, the mean daily sedentary behavior totaled 8.86 hours. The percent decrease from baseline was greater among girls than boys (7.0% versus 1.4%) and urban than rural students (7.7% versus 2.3%). Full results from the growth models overall and by important student factors will be presented.

Conclusions:

Given this is one of the few studies internationally to examine the trajectories of adolescent sedentary behavior, results will provide important evidence to better understand changes in sedentary behaviors among this population.

O05.4

Challenging traditional definitions of the home neighbourhood: How far do adolescents roam from home to be physically active?

Authors:

Emma Coombes, Andy Jones, Ashley Cooper, Angie Page

Purpose:

Environmental characteristics of home neighbourhoods are hypothesised to be associated with residents' physical activity levels, yet many studies report only weak associations. We propose this is in part a result of inappropriate definitions of what constitutes a neighbourhood. We objectively measured the distance that adolescents roamed from home to undertake physical activity and examined how this corresponded to traditionally defined measures of home neighbourhood supportiveness.

Methods:

Data were analysed from 571 UK adolescents in the PEAR project. Each participant wore an accelerometer and a GPS device for seven days. These data were integrated into a Geographical Information System containing information on participants' home neighbourhoods and measures of environmental supportiveness. We then identified the distance

from home that adolescents undertook different intensities of physical activity and examined how this related to home neighbourhood supportiveness.

Results:

We found that being in a less supportive neighbourhood did not negatively impact adolescents' physical activity levels, indeed these participants recorded more minutes of physical activity, at all intensities, than those in more supportive neighbourhoods. However, adolescents from less supportive neighbourhoods roamed further from home to undertake light, moderate, and vigorous activity than those from more supportive neighbourhoods.

Conclusions:

These findings suggest that traditional definitions of the home neighbourhood may be more relevant for those living in more supportive local environments. Given that the relevance of this exposure appears associated with its value, this has important methodological implications for researchers seeking to understand the role of the home environment in supporting physical activity.

Orals 06

Older Adults and Physical Activity

Moderator: Afroditi Stathi

Affiliation: University of Bath, Bath, UK

O06.1

A feasibility study of a peer volunteering intervention for promoting active ageing in the community: Project ACE

Authors:

Afroditi Stathi, Janet Withall, Kenneth R. Fox, Mark Davis, Janice L. Thompson, Gray Selena, Liz Lloyd, Graham Parkhurst

Purpose:

Project ACE (Active, Connected and Engaged) is a theory-informed, pragmatic intervention using peer volunteering support to promote active ageing. The purpose of ACE was to establish the feasibility of delivery and acceptability of the intervention.

Methods:

Fifty four older adults were recruited as volunteers (n=15) or intervention recipients (n=39). Recipients were randomised to either one-to-one support by a peer volunteer or a waiting list control group. Recruitment and retention rates were recorded. Physical activity was assessed with accelerometry at baseline, 3 and 6 months (post-intervention). A mixed-methods approach was adopted to explore the degree to which the intervention was able to operationalise the underlying theoretical framework, the Process Model for Lifestyle Behavior Change. Intervention recipients were administered a process evaluation questionnaire at baseline, 3 and 6 months. All volunteers and intervention recipients participated in semi-structured interviews post-intervention. Qualitative data were analysed using Framework Analysis.

Results:

Retention rate was good. Eighty five percent of ACE participants provided data at both baseline and 6 months. At 3 and 6 months, the intervention group showed significantly improved general confidence to get out and about ($p=.038$, $p=.003$), increased confidence in facing specific barriers ($p=.011$, $p=.015$), increased knowledge of local initiatives ($p=.001$, $p=.007$) and increased social support ($p=.010$, $p=.018$). The qualitative findings supported the acceptability and feasibility of the intervention.

Conclusions:

Results indicate that while recruitment was challenging, ACE is feasible and acceptable to volunteers and recipients and increases key motivational processes. ACE will be further assessed for its effectiveness and cost-effectiveness.

006.2

The relationship between social support and objective physical activity in older adults in Continuing Care Retirement Communities (CCRC)

Authors:

Michelle Black, Shahrokh Golshan, Claudia Pena, Lu Wang, A'verria Martin, Katie Crist, Simon Marshall, Jacqueline Kerr

Purpose:

Despite benefits associated with physical activity (PA), less than 3% of older adults meet national guidelines. Theoretical models have suggested social support (SS) as an important construct related to increased PA. The purpose of the present study was to examine the association between SS and objectively measured PA in a population of older adults living in CCRCs.

Methods:

307 participants wore an Actigraph GT3X+ accelerometer for 6 days for a minimum of 10 hours per day. Average daily PA time was computed for low-light PA as the number of minutes spent at less than 100 to 1040 counts per minute (CPM), for high-light PA from 1041 to 1951 and for moderate/vigorous PA greater than 1952 CPM. Participants also completed an 8-item SS survey, measuring instrumental and emotional support from spouses, friends on campus, visiting friends or family, and CCRC staff. Data were analyzed using multiple regression adjusting for total wear time (minutes) and age.

Results:

The mean age of participants was 84+6 yrs. No significant relationships were found between SS and low-light intensity PA. Emotional and instrumental support from friends significantly predicted high-light intensity PA ($B = .120$, $t=2.2$, $p = .029$) and instrumental support from all sources significantly predicted moderate intensity PA ($B = .131$, $t=2.4$, $p = .018$).

Conclusions:

In CCRCs, support from friends as well as tangible support (e.g., walking with another resident) may be especially important in encouraging PA in older adults.

006.3

Physical activity and dementia: The effects of a multicomponent exercise program on cognition and physical fitness of institutionalized patients with Alzheimer's disease

Authors:

Elisa Marques, Joana Carvalho, Arnaldina Sampaio, Jorge Mota

Purpose:

The aim of this study was to investigate the effect of a multimodal exercise intervention on cognitive functions, anthropometric variables and physical fitness in patients with Alzheimer's Disease (AD).

Methods:

The subjects consisted of 32 institutionalised elders clinically diagnosed with AD, (84.34 yrs \pm 5.9) with mild/moderate dementia, who were divided into two groups: The experimental group (EG, $n=16$) and the control group (CG, $n=16$). The EG participated in a supervised multicomponent exercise programme 1h/day, twice/week, for six months. Participants in the CG maintained their regular daily activities during the same period. Cognitive function, anthropometric variables and physical fitness, were assessed beforehand (M1), after 3 months (M2) and after 6 months (M3) of exercise training.

Results:

No significant group differences were found at the baseline for any variable. A two-way factorial ANOVA, with repeated measurements, revealed significant (group vs time) interactions on cognitive function, waist circumference, and chair-stand, arm-curl, 8-ft up-&-go, 2-min-step, chair sit-&-reach and back-scratch tests. Accordingly, a different response in each group was evident over time for those variables, supported by a significant decrease in waist circumference, an

increase in physical fitness tests from M1 to M3, and a significant increase in MMSE from M1 to M2 in EG. Cognitive function and the performance in the arm-curl test, chair sit-&-reach test significantly decreased over time (M1 vs M3) in the CG.

Conclusions:

These results allowed us to verify that multicomponent exercise can be a significant element in the promotion and maintenance of health, allowing higher cognitive and fitness functions compared to inactive subjects.

O06.4**Effects of a multilevel intervention on step counts in older adults at three months****Authors:**

Jacqueline Kerr, Simon Marshall, Shah Golshan, Katie Crist, Khalisa Bolling, Dori Rosenberg, James Sallis, David Buchner

Purpose:

Older adults in retirement communities are among the least active population segment. In a randomized controlled trial, assess whether a multi level intervention including individual, interpersonal and environmental components increased step counts in older adults living in continuing care retirement communities.

Methods:

Older adults (average age 83) were recruited from 11 retirement communities. The communities were randomized to an attention control condition or a multilevel walking intervention. Participants were encouraged to increase daily steps by 3000 over a three month period. Participants received a pedometer, logs, progress charts, individual counseling, group education and problem solving, and maps of community and neighborhood walks. Step counts were measured at baseline and 3 months by Actigraph accelerometer. Repeated measures analyses of variance were performed adjusting for age and gender. Average daily step counts were log transformed and standardized to 12 hours of wear.

Results:

In 247 participants, there was a significant time x group interaction ($F=7.7$, $p=.006$). In the intervention group, daily step counts increased by 877 steps; from 8708.0 (SD 265.2) to 9585.4 (SD 341.4). In the attention control condition, daily step counts reduced by 163 steps; from 8225.6 (SD 242.0) to 8062.7 (SD 278.8).

Conclusions:

A multilevel intervention succeeded in increasing step counts in an elderly and vulnerable population who would naturally be reducing their physical activity levels.

Orals 07**Nutrition Interventions in Home and School**

Moderator: Nancy Wells

Affiliation: Cornell University, Ithaca, NY, USA

O07.1**Do school gardens affect physical activity and diet? A randomized controlled trial in low-income schools****Authors:**

Nancy Wells, Beth Myers, Brad Gaolach, Charles Henderson, Martha Aitken, Gretchen Ferenz, Caroline Tse, Karen Barale

Purpose:

This randomized controlled trial (RCT) examines the effects of school gardens on children's physical activity and diet.

Methods:

This 2-year RCT examined the effects of a school garden intervention on elementary school children's physical activity and fruit and vegetable (FV) consumption. More than 2000 students from 49 low-income schools in Arkansas, Iowa, New

York and Washington participated in the study. Schools were randomly assigned to receive school gardens or to serve as wait-list control schools that received gardens at the end of the data collection period. Physical activity was operationalized with three measures: Accelerometry, the GEMS Activity Questionnaire (GAQ), and direct observation. Fruit and vegetable (FV) consumption was measured using lunch tray photography and food frequency questionnaires. FV preference was measured by survey. Analyses were conducted using hierarchical linear modeling.

Results:

Physical activity results indicate the intervention group increased proportion of time spent in moderate physical activity (MPA) and moderate to vigorous physical activity (MVPA) compared to pre-garden baseline and to the non-garden control group. In addition, over time, children in the garden intervention are less sedentary in their overall activities than control group children. Dietary intake results provide insight regarding under what circumstances gardens influence FV preference and consumption.

Conclusions:

School gardens are unique in their potential to affect both sides of the energy balance equation. Results suggest gardens hold promise as an intervention strategy to promote proper nutrition and physical activity.

007.2**LA Sprouts: Preliminary results from a garden, nutrition and cooking program for low-income Hispanic children****Authors:**

Jaimie Davis, Lauren Cook, Donna Spruijt-Metz, Nicole Gatto

Purpose:

School gardening programs have gained popularity, however, there is a paucity of randomized controlled trials (RCTs) examining the effect of garden-based educational programs on health outcomes. Thus, the overall goal of this study is to conduct a RCT to assess the impact of a 12-week garden, nutrition, and cooking program (called "LA Sprouts") on improving dietary intake and reducing obesity and related metabolic parameters in low-income Hispanic children.

Methods:

This 12-week RCT conducted in after-school settings included four elementary schools and 350 Hispanic children (8-10 y) living in Los Angeles. The following measures were collected at baseline and post-intervention: Demographic data, anthropometrics (BMI parameters and waist circumference), body fat via bioimpedance, blood pressure, dietary intake via screener, metabolic parameters via voluntary fasting blood draw.

Results:

To date, two of three planned waves of the intervention have been completed; 310 families have provided informed consent. Of these, 248 (80%) completed both baseline and post-intervention standard measures. Ninety-eight children (40%) participated in the voluntary baseline and post-intervention blood draws. After the 12-week intervention, LA Sprouts subjects (n=134) compared to controls (n=114) had significant reductions in BMI (-3.8% vs. +8.9%; p=0.007), BMI z scores (-12.6% vs. -3.2%; p=0.008) and waist circumference (-17.0% vs. +0.1%; p<0.001), and significant improvements in dietary fiber intake (+6.5% vs. -6.7%; p=0.05) and vegetable intake (-6.3 vs. -32.4%; p=0.04).

Conclusions:

Preliminary findings demonstrate that a garden/cooking-based program results in improved dietary intake and reduced obesity parameters in low-income Hispanic children, where other programs have failed.

007.3**Impact of the 'Healthy Dads, Healthy Kids' lifestyle program on the activity-and diet-related parenting practices of fathers and mothers****Authors:**

Adam Lloyd, David Lubans, Ronald Plotnikoff, Philip Morgan

Purpose:

The aim of this study was to evaluate the impact of the 'Healthy Dads, Healthy Kids (HDHK)' program delivered to fathers in a community setting on fathers' activity- and diet-related parenting practices. A secondary aim was to investigate if there was an impact on mothers' activity- and diet-related parenting practices.

Methods:

Overweight/obese fathers (n=87) and their primary school-aged children (56% boys) were randomized to either (i) 7-week HDHK program (n=45 families) or (ii) wait-list control group (n=42 families). The program involved four information sessions for fathers only and three with fathers and children. Mothers were not directly targeted. Parenting practices of both fathers and mothers were measured using the Parenting Strategies for Eating and Activity Scale (PEAS) at baseline and 14-week follow-up.

Results:

Intention-to-treat analysis using linear mixed models revealed significant group-by-time effects for fathers' limit setting ($p=0.048$, $d=.36$), and reinforcement for multiple health behaviors ($p=0.001$, $d=.79$). No significant intervention effects were found for fathers' control, monitoring, discipline or mothers' parenting practices ($p > .05$).

Conclusions:

The HDHK program had a positive impact on some diet- and physical activity-related parenting practices of fathers. The intervention did not impact upon mothers' parenting practices.

007.4**Outcomes of the Healthy Home Offerings via the Mealtime Environment (HOME) Plus trial****Authors:**

Jayne Fulkerson, Sarah Friend, Colleen Flattum, Dianne Neumark-Sztainer, Mary Story, Olga Gurvich, Ann Garwick, Martha Kubik

Purpose:

To describe outcomes of the HOME Plus program, the first family-meals focused program using a randomized controlled trial (RCT) design to prevent childhood obesity and promote health.

Methods:

The RCT included 75 boys and 85 girls ($M=10.4$ yrs; 66% white; 45% overweight) and their parents (152 women, 8 men; $M=41.4$ yrs; 76% white; 61% overweight), randomized to intervention ($n=81$) or control ($n=79$) conditions. Designed using Social Cognitive Theory, the HOME Plus program included 10 monthly sessions focused on nutrition/activity education, meal planning and preparation skill development and was delivered to families in community settings. In addition, five motivational goal-setting calls were conducted with parents. General linear models tested post-intervention child BMI-z-score, family meal frequency, screen-time, home food availability and dietary intake by child age (8-9.9, 10-12) by condition interaction, adjusted for baseline values and demographic characteristics (child gender, parent race/ethnicity, and economic assistance). Parent psychosocial scores were tested by condition, adjusted for parent age, race/ethnicity, and economic assistance.

Results:

At post-intervention, compared with other children, younger control children had significantly higher BMI-z-scores ($F(1,140)=4.11$, $p=.04$) and significantly lower family meal frequency ($F(1,139)=5.90$, $p=.02$), controlling for covariates. No effects were shown for other child outcomes. Significant treatment effects were seen for parent cooking skills ($F(1,138)=6.01$, $p=.02$) and parent self-efficacy for portion size knowledge ($F(1,140)=14.52$, $p=.0003$).

Conclusions:

Promoting frequent and nutritious family meals and snacks with a focus on cooking skill development and healthful portion sizes in younger preadolescent boys and girls and their families may be an effective approach for obesity prevention.

Orals 08 Active Transport

Moderator: Benedicte Deforche

Affiliation: Vrije Universiteit Brussels, Brussels, Belgium

O08.1

Critical environmental factors for transportation cycling in children: A qualitative study using bike-alongs

Authors:

Benedicte Deforche, Ariane Ghekiere, Jelle Van Cauwenberg, Bas de Geus, Peter Clarys, Greet Cardon, Jo Salmon, Ilse De Bourdeaudhuij

Purpose:

Environmental factors are found to influence transport-related physical activity, but have rarely been studied in relation with cycling for transport to various destinations in 10-12 yr old children. The current qualitative study used bike-alongs with children and parents to allow discussion of detailed environmental factors that influence children's cycling for transport, while cycling in the target-environment.

Methods:

Purposeful convenience sampling was used to recruit 35 children and one of their parents residing in (semi-)urban areas. Bike-alongs were conducted to and from a randomly chosen destination (e.g. library) within a 15 minutes' cycle trip in the participant's neighborhood. Participants wore a GoPro camera to objectively assess environmental elements, which were subsequently discussed with participants.

Results:

The discussed environmental factors were categorized as road safety, personal safety, cycling facilities, aesthetics, connectivity, distance to destination and weather. Across these categories many environmental factors were (in)directly linked to road safety. This was illustrated by detailed discussions of the children's visibility, familiarity with specific traffic situations, and degree of separation, width and legibility of cycle facilities. Other discussed environmental factors were of minor importance to road safety.

Conclusions:

Physical environmental factors were discussed with a major concern of road safety. Bike-alongs were able to identify new detailed and context-specific physical environmental factors which could inform policy makers promoting children's cycling for transport. However, future studies should investigate if such physical environmental changes influence perceptions of safety and if this in turn could lead to changes in children's cycling for transport.

O08.2

Associations of children's mode of school commuting with health outcomes

Authors:

Clare Hume, Jo Salmon, Kylie Hesketh, David Dunstan, Robin Daly, Ester Cerin, David Crawford, Anna Timperio

Purpose:

This study examined associations between school commuting mode and children's cardiovascular and metabolic health.

Methods:

Participants were 226 children (48% boys), aged 8.1 (SD 0.4) years from Melbourne, Australia. Mothers reported their own highest level of education, and the frequency and duration of their child's typical active (walking or cycling; 0 trips, 1-5 trips, >6 trips/week) and sedentary (travelling by car/bus; 0 trips, 1-60 mins, >60 mins/week) school commuting. Children's waist circumference, blood pressure, height and weight were measured and BMI calculated. A

fasted, morning blood sample determined total serum cholesterol, high-density lipoprotein (HDL-C), low density lipoprotein (LDL-C) cholesterol, triglycerides, fasting plasma glucose (FPG) and insulin resistance. Moderate- to vigorous-intensity physical activity (MVPA; ≥ 4 METs) and sedentary time (≤ 100 counts/min) were objectively-measured using accelerometry. Associations were assessed by linear regression, adjusting for sex, maternal education, children's MVPA or sedentary time (respectively) and clustering by school (unit of recruitment).

Results:

There was an inverse association between active commuting frequency ($p=0.04$) and duration ($p=0.04$) and LDL-C scores. Increases in both frequency and duration of active commuting were associated with an approximately 0.12mmol/L decrease in LDL-C. A positive association was found between FPG and sedentary commuting duration ($p=0.05$), with increased duration associated with an approximately 0.09mmol/L increase in FPG. No other significant associations were observed.

Conclusions:

School commuting mode showed significant associations with two serum biomarkers. Interventions aiming to increase active commuting and decrease sedentary commuting are warranted as they may have an important positive effect on some aspects of children's metabolic health.

008.3

Child weight status moderates association between active commuting to school and parental perceptions of the environment

Authors:

Robin DeWeese, Punam Ohri-Vachaspati

Purpose:

This study uses child weight status as a moderator to extend analysis identifying the association of parents' perceptions of the neighborhood with active commuting to/from school (ACS) among children in four low-income, densely populated, high-minority urban communities.

Methods:

Data were collected in 2009-10 from households with children who attended school in four New Jersey cities. Parents provided measured heights and weights data for 485 children. Multivariate logistic regression analyses identified parental perception of the neighborhood as unpleasant as a factor associated with lower odds of ACS. Weight status was then interacted with unpleasantness to examine whether weight moderated this effect.

Results:

48% of the sample was female, mean age was 10.8 years, 46% engaged in ACS, and 36% were overweight/obese. Children whose parents perceived the neighborhood as very unpleasant for activity had lower odds of engaging in ACS ($OR=0.39$, 95% CI 0.19-0.80). In moderation analysis, among overweight/obese children, parental perception of the neighborhood as unpleasant for activity was associated with 98% ($OR=0.02$, 95% CI 0.00-0.14) lower odds of ACS; the association among normal weight children was not significant.

Conclusions:

Parents' perceptions of the pleasantness of the neighborhood as a predictor of their children's ACS may be moderated by the child's weight status. Overweight/obese children may be highly susceptible to decreasing ACS in response to negative influences of the environment in which they live. Improving neighborhood environments by cleaning up graffiti, providing shade trees, etc. may increase the likelihood of ACS, especially among overweight/obese children.

O08.4

The relationship between patterns of active travel and body mass index in UK adolescents

Authors:

Catherine Falconer, Sam Leary, Angie Page, Ashley Cooper

Purpose:

To examine the association between patterns of active travel through adolescence, body mass index (BMI) and obesity at age 17 in a UK cohort.

Methods:

We used data from the Avon Longitudinal Study of Parents and Children (ALSPAC) birth cohort. The analyses include all children providing valid data on self-reported travel mode (active or passive) to school at ages 11, 13 and 15 years, and measured height, and weight at age 17 (n=2,443). Linear regression analyses were used to examine associations between travel pattern and derived body mass index (BMI) at 17 years. Logistic regression was used to examine the association between travel pattern and obesity at 17. All analyses were adjusted for height, gender, age at measurement and parental social class with interaction terms fitted to assess gender differences in the strength of these associations.

Results:

Between the ages of 11 and 15 years, 26.7% of children consistently used active modes of travel, and 36.4% were consistently passive. There was evidence of a gender interaction in the association between travel pattern and BMI. In boys, being consistently active was associated with a lower BMI at age 17 ($B = -0.74\text{kg/m}^2$, 95% CI -1.3, -0.1, $p=0.016$) and reduced odds of being obese (OR: 0.66, 95% CI 0.4, 1.1, $p=0.096$) compared to children with a consistently passive travel pattern. No associations were seen in girls.

Conclusions:

Maintenance of active travel through adolescence may offer protection against the development of excess BMI in boys but not girls.

O08.5

Factors influencing mode of transport for short distance travel in young adults: A qualitative study

Authors:

Dorien Simons, Peter Clarys, Ilse De Bourdeaudhuij, Bas de Geus, Corneel Vandelanotte, Benedicte Deforche

Purpose:

Transitioning from secondary school to university/college or a job is related to decreased physical activity and increased weight gain in young adults (18-25 years). Increasing active transport might be suited to maintain their overall physical activity. To promote active transport, knowledge of factors influencing all transport modes is necessary. This study explored factors influencing transport choice for short distance travel to various destinations in working/studying young adults using focus groups.

Methods:

Nineteen students (mean age of 21 ± 1.1 years) and 17 working young adults (mean age of 23 ± 1.5 years) were recruited as volunteers in Antwerp (Belgium). Three focus groups were conducted with students and three with working young adults. Content analysis was performed using NVivo 9 software (QSR International). Grounded theory was used to derive categories and subcategories.

Results:

Data were categorized in three main themes with several subcategories: Personal factors (high autonomy, low costs, vehicle ownership, travel purpose, good comfort, and health), social factors (good social support) and physical environmental factors (short travel time, an adapted built environment, good access to facilities, good weather, perceived safety and ecology).

Conclusions:

When promoting active transport in young adults, health benefits or ecological benefits should not be emphasized. Focus should be put on cycling instead of walking, on flexibility, speed, good social support and low costs. Also, more bicycle storage and workplace facilities should be provided. Owning a private car should be avoided and public transport should be optimized to fit the needs of young adults.

O08.6**Walking and cycling to work in high and low walkable neighborhoods in Czech Republic: Analysis of travel to work census data from 2001 and 2011****Authors:**

Jan Dygryn, Josef Mitas, Ales Gaba, Lukas Rubin, Lukas Jakubec, Dana Feltlova, Karel Fromel

Purpose:

The aim of this study was to compare walking and cycling to work between 2001 and 2011 in a context of different types of walkable neighborhoods.

Methods:

Travel to work data from the 2001 and 2011 Population and Housing Census were obtained from the Czech Statistical Office. The dataset included all respondents aged 25-55 with permanent residence and employment in Olomouc or Hradec Kralove and who answered the question, how did this person usually get to work. The proportion of people walking and cycling to work was calculated by dividing the number of trips to work by walking and bicycling by the total number of routes to work. The walkability of neighbourhoods was classified in Geographical Information System using the variables street connectivity, residential density and land use mix. Data were analyzed using software Statistica 10, StatSoft, Inc.

Results:

The proportion of respondents walking or cycling to work decreased by 14.20 percentage points between 2001 and 2011. In 2001, 39.63 % of trips to work in high walkable neighbourhoods were made by walking or cycling, compare to 31.40 % in low walkable neighbourhoods. In 2011, 26.30 % of trips to work in high walkable neighbourhoods were made by walking or cycling, compare to 16.23 % in low walkable neighbourhoods.

Conclusions:

Comparison of data between 2001 and 2011 indicates downward trend in walking and cycling to work in Czech adult population. The type of walkable neighborhoods does not have significant role in this decreasing trend.

O08.7**15-item streetscape audit is related to active transportation in four age groups: MAPS-Mini****Authors:**

James F. Sallis, Kelli L. Cain, Terry L. Conway, Kavita Gavand, Rachel A. Millstein, Carrie M. Geremia, Lawrence D. Frank, Brian E. Saelens

Purpose:

Macro-level built environment factors (e.g., street connectivity) are correlated with physical activity (PA), but less-studied, more-modifiable micro-level elements (e.g., crosswalks) may also impact PA. Short audit instruments are needed, so the present study evaluated the relation of the 15-item MAPS-Mini to active transport.

Methods:

The full 120-item Microscale Audit of Pedestrian Streetscapes (MAPS) measures attributes of street design, sidewalks, and street crossings. A 15-item version was developed based on item associations with PA and attribute modifiability. MAPS was completed along a .25 mile route from participant homes toward the nearest non-residential destination for children (n=758), adolescents (n=897), younger adults (n=1655), and older adults (n=367). Active transportation was

measured with validated age-appropriate surveys. Mixed model regressions were conducted for each MAPS item and a Grand Score, adjusted for demographics, spatial clustering, and GIS-based macro-level walkability.

Results:

Grand Scores were significantly related to active transportation in all age groups (adjusted t's ranged from 2.15, $p < .05$ in older adults to 5.58, $p < .001$ in younger adults). Number of items significantly related to active transportation was 2 for adolescents, 5 for older adults, 6 for children, and 9 for younger adults. Items related to outcomes in 3 age groups were presence of sidewalks, curb cuts, street lights, benches, and buffer between street and sidewalk. Grand Scores of MAPS-Mini and full MAPS correlated $r = .85$.

Conclusions:

MAPS-Mini is short enough to be practical for use by cities and community groups and is a reasonable substitute for the full version that is 8 times longer.

Orals 09

Cognitive Functions, Academic Achievement and School Outcomes

Moderator: Donna Spruijt-Metz

Affiliation: University of Southern California, Los Angeles, California, USA

009.1

Using socially assistive robots for elementary school nutrition education through play

Authors:

Elaine Short, Katelyn Swift-Sprong, Jillian Greczek, Maja Matarić, Gisele Ragusa, Donna Spruijt-Metz

Purpose:

Robots are powerful pedagogical agents with interactive, real-time feedback capabilities. To date, the essential attraction that robots exert on children has been underutilized in childhood obesity prevention and treatment. This presentation describes the development, delivery and evaluation of a 6-session interaction between an ethnically and geographically diverse group of 26 first-grade children and the DragonBot robot in the context of teaching healthy food choices.

Methods:

Six evidence-based nutrition sessions were developed. Curriculum was delivered in first grade classrooms, two sessions per week over three weeks, one 'expert' session and one 'collaborative' session per week. Participants were aged 5-8 years. Response to the robot and ratio of healthy versus unhealthy food choices during each session were measured.

Results:

Response time relative to the robot's questions decreased significantly over the course of the interaction (week 1 versus week 3, $p < 0.05$), suggesting that children felt increasingly comfortable with the robot. Furthermore, children demonstrated an extremely positive response to the robot before the interaction, and that response did not decrease over the 3-week intervention. Finally, nutrition learning occurred, as measured by children's ratio of poor food choice (as compared to healthy food choice) during each session. The ratio of unhealthy choices decreased from .46 in the first session to .39 in the last session. The intervention was too short to show significant changes in dietary intake.

Conclusions:

These results are promising for the use of socially assistive robotic technologies for long-term one-on-one educational interventions for younger children.

009.2

Sleeping for health: An assessment of healthy sleep promotion in elementary schools

Authors:

Hena Din, Griselda Cervantes, Kelsie Full, Jamie Moody, Leticia Ibarra, Amy Binggeli, Guadalupe X. Ayala

Purpose:

Inadequate sleep is a silent problem among school-aged children. Lack of sleep has been linked to childhood obesity and other developmental issues. Health promotion and school wellness policies in elementary schools primarily focus on healthy eating and physical activity, whereas promotion of healthy sleep habits is limited to testing periods. This study assessed principals' perceptions on the prevalence of sleep-related issues and healthy sleep promotion in elementary schools.

Methods:

Data are from a multi-level, multi-sector childhood obesity research demonstration study. Elementary school principals (n=20) were recruited from Imperial County, California, USA, a primarily Hispanic US-Mexico border community. Principals participated in a baseline interview to assess general health and wellness policies and procedures including sleep. Analysis were primarily descriptive statistics in nature.

Results:

Median school size was 493 students and 80% of students were eligible for free or reduced meals. Most principals (95%) considered their students to have some sleep-related problems. However, more than half reported that teachers did little to no role modeling of healthy sleep habits (65%). In addition, 30% of principals reported no provision of sleep-related information to students, 45% reported providing it only during testing, and 25% reported providing it regardless of testing. None of the school wellness policies addressed promotion of healthy sleep habits.

Conclusions:

Findings suggest a gap in school health promotion, notably the lack of policies and promotions related to healthy sleep habits. More research is needed on methods for promoting healthy sleep in schools given its association with obesity and school performance.

009.3

School's out and the kids are getting heavy: A quasi-natural experiment to examine the effects of a modified school year calendar on BMI

Authors:

Amy Bohnert, Kimberly Burdette, Amanda Ward, Lara Dugas

Purpose:

Youth gain weight twice as fast during the summer as compared to the rest of the year. This is the first study to examine BMI differences between youth who attend schools with a traditional summer break as compared with modified year-round calendars.

Methods:

Participants were 10-14 year old low-income minority girls (N=52). Girls attended a public school that utilizes either: 1) a traditional calendar (Track A/R) and 10 consecutive weeks of vacation during the summer or 2) an extended calendar (Track E) with 10 weeks of vacation distributed throughout the year. Anthropometric measurements were used to calculate BMI, and the BMI-for-age percentile was determined using the Centers for Disease Control and Prevention (CDC) national norms. Accelerometers and 24 hour dietary recalls were also utilized.

Results:

Independent t-tests revealed that girls who were enrolled in Track A/R schools (n=30, M=81.17) had significantly higher BMI percentiles compared to Track E girls (n=22, M=59.87), $t(50)=-2.69$, $p=.011$, Cohen's $d=-.76$. The standard deviation of each subsample's BMI percentiles reached into the obese range (≥ 95 th BMI percentile) for Track A/R girls but only

the overweight range for Track E girls. Additional analyses will be conducted to determine whether these girls differ in terms of physical activity and dietary intake.

Conclusions:

Considering that girls in Track E calendar schools participated in no more days of school than girls in Track A/R calendar schools, these preliminary results provide compelling evidence, particularly considering the medium-to-large effect size, for the detrimental effects of extended summer vacations.

009.4

Cardiorespiratory, motor and muscular fitness in relation to academic performance in youth. The UP & DOWN study

Authors:

Irene Esteban-Cornejo, Carlos M^a Tejero-González, David Martínez-Gómez, James F. Sallis, Ana González-Galo, Carmen Padilla-Moledo, Juan del-Campo

Purpose:

To examine the independent and combined associations of the components of physical fitness with academic performance among youth.

Methods:

This cross-sectional study was conducted with a total of 2044 youth (994 girls) aged 10.4 ± 3.4 years. Cardiorespiratory fitness was measured using the 20-m shuttle run test. Motor fitness was assessed with the 4×10 -m shuttle-run test of speed-of-movement, agility and coordination. A muscular fitness score was computed using handgrip strength and standing long jump. Academic performance was assessed through schools records.

Results:

Cardiorespiratory and motor fitness were independently associated with all academic variables in youth, even after adjustment for fitness and fatness indicators (all $p \leq 0.001$); whereas muscular fitness was not associated with academic performance independently of the other two physical fitness components. In addition, the combined adverse effects of low cardiorespiratory and motor fitness on academic performance were observed across the risk groups (p for trend < 0.001). Youth in the non risk group had significantly higher scores in all the academic indicators than the medium risk group (ranging from +0.300 to 0.350 score, all $p < 0.001$) or the highest risk group (ranging from +0.417 to 0.494 score, all $p < 0.05$).

Conclusions:

Cardiorespiratory and motor fitness, both independently and combined, may have a beneficial influence on academic performance in youth.

009.5

Testing self-determination theory in a classroom-based physical activity intervention: Effects on enjoyment and math performance

Author: Spyridoula Vazou

Purpose:

Physical activity (PA) in the academic classroom is an innovative approach aimed at promoting academic achievement. This study examined (a) the impact of a two-month classroom-based PA intervention on student motivation, defined according to Self-Determination Theory, and (b) the association of need satisfaction, enjoyment, and math performance.

Methods:

Nine fifth-grade classes were assigned to (a) an integrated PA-with-math-practice group (IntPA; 3 classes, N=58), (b) an activity break group (AB; 3 classes, N=59), and (c) a traditional-instruction group (control; 3 classes, N=49).

Results:

Repeated-measure ANCOVAs, controlling for perceived math competence, showed that students in groups (groups b and c combined) enjoyed the lessons more (time x group interaction, $F=8.58$, $p<.01$), and perceived higher satisfaction of their need for competence in the classroom (time x group interaction $F=4.66$, $p<.05$), compared to the control group. The perceived satisfaction of their needs for autonomy and relatedness in the classroom remained stable. Hierarchical regression analysis, controlling for baseline math performance, showed that enjoyment was a significant predictor of math performance after the intervention only in the IntPA group ($\beta=.27$, $p<.05$, $F=4.47$, R^2 change=.07). Additionally, all three needs (relatedness $\beta=.19$, $p<.05$, competence $\beta=.19$, $p<.05$, autonomy $\beta=.46$, $p<.001$) significantly predicted enjoyment in the PA classrooms ($F=32.76$, $p<.001$).

Conclusions:

These data contribute to a growing evidence base indicating that physical activity in the academic classroom is not disruptive but rather conducive to academic attainment. One possible mechanism for this effect is that PA promotes enjoyment of the academic lessons through the satisfaction of basic psychological needs.

009.6**How eating behavior and physical activity relate to affect over an academic year: An intensive longitudinal assessment study****Authors:**

Lavinia Flückiger, Roselind Lieb, Andrea Meyer, Cornelia Witthauer, Jutta Mata

Purpose:

This intensive longitudinal study examined how physical activity and eating behavior relate to university students' academic performance during stressful and non-stressful periods and whether this relation is mediated through affect.

Methods:

Over the first year at university, 125 students filled out 65 online-assessments about their physical activity, eating behavior, learning goal achievement, and positive and negative affect over the last 24 hours (day-to-day level). At the end of the academic year they also stated their examination grades. Data were analyzed using multilevel structural equation models.

Results:

On both, the non-time-varying interindividual level as well as the day-to-day level, regular eating behavior predicted better learning goal achievement; there was no relation between physical activity and learning goal achievement. Better average learning goal achievement in turn predicted examination success. Concerning interindividual variability, the relations of average physical activity and eating behavior with average learning goal achievement were mediated by positive affect. On the day-to day level, positive and negative affect both mediated the effect of physical activity on learning goal achievement, but did not mediate the relation between eating behavior and learning goal achievement.

Conclusions:

Health behaviors such as physical activity and eating behavior seem to be involved in experienced affect, an indicator for mental health, and academic performance. The results enhance the understanding of inter- and intra-individual variations in health behaviors, affect, and academic performance during stressful and non-stressful periods, and could inform prevention and intervention programs for university students.

Orals 10

Family Diet and Cooking

Moderator: Mona Bjelland

Affiliation: University of Oslo, Oslo, Norway

O10.1

Development of a conceptual framework and questionnaires measuring important and changeable family processes that potentially influence dietary behaviors of adolescents

Authors:

Mona Bjelland, Solveig Hausken, Ester Sleddens, Hanne Lie, Lene Frost Andersen, Lea Maes, Arnstein Finset, Nanna Lien

Purpose:

To be able to develop interventions that actually improve dietary behaviors, more research is needed to investigate changeable factors in the family and home environment. The overall aim of this study was to develop a conceptual framework and questionnaires for adolescents and their parents (both female and male guardians) measuring family processes that potentially influence dietary behaviors of 13-14 year olds.

Methods:

Initial steps involved review of the literature, collaboration with experts and development of a conceptual framework. Drafts of the questionnaires were made and scales were translated and back-translated. Cognitive interviewing, time testing and a written evaluation of the questionnaires were conducted in the target groups.

Results:

The dietary behaviors assessed were intake of vegetables (to be promoted) and sugar sweetened beverages (to be regulated). The following constructs were included in the framework and questionnaires; socio demography, dietary intakes, (family) meals, accessibility, family functioning, cohesion, conflict, positive encouragement, healthy eating guidance, monitoring, parental style of regulation, general parenting style, adolescent's impulsivity, weight and height. For constructs related to parenting practices/styles, the adolescents reported separately for mothers and fathers.

Conclusions:

The conceptual framework developed may be a useful tool in guiding measurement and assessment of the home food environment and family processes related to adolescents, and their parents, for dietary behaviors in particular and energy balance-related behaviors in general. To our knowledge this is the first study to assess the adolescent's perspective of both mother's and father's parenting practices/styles, and the mothers' and fathers' perspectives within the same study.

O10.2

The impact of the family and home environment on child weight in early childhood across development

Authors:

Kelly Lowry, John Lavigne

Purpose:

To determine specific parent, child, and home factors that predict child weight in early childhood across time.

Methods:

Parent-child dyads of 2- to 3-year-old children participated in a home-based assessment and completed the Child Feeding Questionnaire, the Children's Eating Behavior Questionnaire, selected subscales of the Home Observation Scale, Food Frequency Questionnaires, and a videotaped and coded mealtime interaction. Assessments were completed at baseline when the child was between 2- and 3-years of age and again 12- to 18-months later when the child was between 3- and 5-years of age.

Results:

105 racially, ethnically, and weight-diverse (59% minority) families participated in the project. Weight outcomes were similar to regional or state-wide averages with child overweight=15%, child obesity=10%, maternal overweight=25%, and maternal obesity=39%. Higher child weight percentile at follow-up was predicted by baseline levels of higher maternal body mass index (BMI; $B=1.45$, $SE=0.32$, $p<.001$), higher use of parental restriction around eating ($B=11.23$, $SE=3.27$, $p=.001$), lower levels of parental pressure to eat ($B=-10.56$, $SE=2.55$, $p<.001$), and higher access to high-sugar/high-fat foods in the home ($B=6.49$, $SE=2.67$, $p=.02$). Taken together, this model accounted for 37% of the variance in child weight at follow-up, $F(5,92)=10.17$, $p<.001$.

Conclusions:

Four parent, child, and household factors have a significant predictive impact on child weight early in development, accounting for over one-third of the variance in child weight. These factors are modifiable and developing an intervention to target these behaviors could have a significant impact on slowing the development of childhood obesity.

O10.3

Does parent report of not having enough time to cook really mean I don't know how?

Authors:

Melissa Horning, Jayne Fulkerson, Sarah Friend, Mary Story

Purpose:

Pre-prepared convenience foods (boxed/frozen meals) are often high in fat, sodium, and/or sugar. Minimal research has investigated reasons parents purchase convenience foods; therefore, associations between reasons for purchasing convenience foods and parental cooking self-efficacy, meal-planning ability, and demographic characteristics were assessed.

Methods:

Based on social cognitive theory/ecological framework, the randomized, community-based HOME Plus trial promoted healthful home food environments and eating behaviors with families of 8-12 year old children ($n=160$). Baseline HOME Plus data was used to test associations using Spearman correlations and Chi-square/Fisher's Exact.

Results:

Top reasons parents reported purchasing convenience foods were: 'I don't have time to prepare other foods' (57%); 'my family likes them' (49%); 'they are easy for my child to prepare' (33%); 'they are inexpensive' (27%); and 'I don't know what else to make' (22%). All reasons except 'they are easy for my child to prepare' were significantly and inversely associated ($r's=-0.18$ to -0.35 , $p's\leq 0.02$) with cooking self-efficacy and meal-planning ability. No significant associations were seen with BMI or income. Most reasons were not significantly associated with demographic characteristics; although, parents reporting 'I don't know what else to make' were more likely to be white (97%, $p<0.01$) and less educated (88% [less than a college degree], $p<0.02$).

Conclusions:

Cooking self-efficacy and meal-planning ability are modifiable, appear to transcend demographic characteristics and are significantly associated with reasons parents purchase convenience foods. Interventions to bolster cooking self-efficacy and meal-planning ability for parents of all backgrounds may prove important in reducing parental purchases of convenient, non-nutritious foods.

O10.4

Development, psychometric testing and evaluation of a survey assessing a national cooking-based nutrition education program in the United States

Authors:

Courtney Pinard, Laura Seman, Julia Quam, Teresa Smith, Amy Yaroch

Purpose:

Cooking Matters for Adults (CMA) teaches low-income adults how to prepare and shop for healthy family meals on a limited budget. The purpose of this study was to develop and psychometrically test a survey that assesses the CMA course, and report on the outcomes of the survey.

Methods:

Survey items were derived from an existing CMA course survey, curriculum and logic model content, and already-validated items from the literature. Modifications were made based on cognitive interviews (N = 21). The survey was pilot tested in a sample of 250 CMA course participants across ten states from September 2012 to April 2013. Survey items were scaled using exploratory factor analysis and tested for internal consistency. Emergent construct scales and dietary patterns and choices were assessed for differences from pre- to post-assessment using paired sample t-tests.

Results:

Four construct scales emerged from the factor analysis: cooking barriers ($\alpha=0.88$), food resource management ($\alpha=0.62$), healthy food preparation ($\alpha=0.70$), and cooking confidence ($\alpha=0.86$). At post-assessment, there were significant increases in intake of green salad, 100% fruit juice, and water; and a significant decrease in intake of sugar-sweetened beverages ($ps<0.05$). All newly developed constructs reflected significant change in the desired direction at post-assessment (e.g., cooking barriers decreased; healthy food preparation increased; and food resource management and cooking confidence improved; $ps<0.05$).

Conclusions:

Nutrition education and cooking measurement scales were developed and tested, which may have utility in assessing other similar programs. Findings showed evidence of improved dietary behaviors and related factors associated with the CMA Program.

O10.5**Improving the theory and evidence base in a community-developed health promotion program: 'Healthy shopping healthy cooking'****Authors:**

Marieke Hartman, Kay Bartholomew, Sjoukje Mos, Linda Highfield, Renée Corstjens

Purpose:

While research-tested nutrition and physical activity interventions for disadvantaged adults may be scarce, there are many local initiatives going on. However, the potential of these community-developed interventions for behavior change can be less than optimal due to limited use of theory and evidence. The purpose of this report is to present an example of a systematic process to improve the theory and evidence base in an existing nutrition intervention while retaining its community-based character.

Methods:

We used Intervention Mapping to compare elements of the original intervention 'Healthy Shopping Healthy Cooking' with behavioral needs and related determinants derived from a needs assessment. Previous implementation experience and gaps between the intervention and needs assessment provided the starting point for adaptation. In a multidisciplinary team we used theory and evidence derived from scientific literature, focus groups, observations, and intervention registrations to fill those gaps and to improve implementation and reach. Adaptations were pretested and pilot-tested.

Results:

Adaptations to the intervention included: Broadening the target population (i.e., multiethnic), setting concrete behavior goals related to weight loss and adapting content to these, addressing additional determinants (e.g., coping with environmental influences), adapting how strategies were applied (e.g., cooking classes), and improvement of reach and implementation strategies (e.g., involving key people).

Conclusions:

The presented process to improve a community-developed intervention with theory and evidence has the potential to enhance health promotion interventions on a large scale. There are numerous local initiatives being implemented, and interventions based on theory and evidence are more likely to be effective.

Orals 11**Determinants of PA and Nutrition**

Moderator: René van Bavel

Affiliation: Institute for Prospective Technological Studies, Joint Research Centre, European Commission, Seville, Spain

O11.1**Is anybody doing it? Effect of normative messages on intention to do physical activity****Authors:**

René van Bavel, Gabriele Esposito, Tom Baranowski

Purpose:

To test whether messages about the physical activity levels of the majority (normative messages) increase intention to participate in regular physical activity among young adults. To examine the possible path of influence of these messages using the model of goal-directed behavior (MGDB).

Methods:

In an experimental survey among 16 to 24 year-olds in Bulgaria, Croatia and Romania (n=1200), a control group received no message, one treatment group was told that the majority was physically active (positive message), and another treatment group was told that the majority was not physically active (negative message). Subsequently, they completed a questionnaire with MGDB scales. Intention to be physically active was measured as a proxy for behavior.

Results:

Both messages had an impact (of similar magnitude) on intention. Paths of influence analysis using MGDB showed that the positive message affects intention via subjective norms and positive anticipated emotions (APE); the negative normative message via subjective norms and attitudes.

Conclusions:

Being exposed to normative messages, regardless of whether they are positive or negative, leads to greater physical activity intention. Subjective norms do account for this effect, as their impact on intention is low. The mediating effect of APE and attitudes, however, merit attention. The prospect of conforming to the majority might lead to greater APE in the positive message. Further analysis is needed to understand the negative message's impact on attitudes.

O11.2**Inter relationships among objectively measured physical activity, sleep and time outdoors****Authors:**

Kate Murray, Jacqueline Kerr, Loki Natarajan, Aaron Hipp, Karen Glanz, Jonathan Mitchell, Peter James, Simon Marshall

Purpose:

Increasing physical activity (PA) may be an important non-pharmacological approach to improve sleep quality but it is not clear how level and timing and co-current light exposure influence sleep quality. PA time outdoors may be more beneficial for sleep, but only recently has it been possible to measure sleep, physical activity, and outdoor time objectively in large-scale studies.

Methods:

350 older adult women (mean age = 55.38 ±9.89 yrs; mean BMI = 27.74 ±6.12) were recruited from different regions of the US. Participants wore a GPS device and an ActiGraph GT3X+ accelerometer on the hip and wrist, for 7 days and 7 nights. Daily minutes in moderate-to-vigorous PA (MVPA) were computed from the hip device, total minutes sleep time (TST) and sleep efficiency (SE) were computed from the wrist device, and time spent outdoors was calculated from GPS using the satellite to device signal-to-noise ratio. A generalized mixed-effect model was used to assess temporal associations between MVPA and sleep at the daily level within individuals.

Results:

An increase in daily MVPA was associated with a decrease in TST ($\beta = -0.11$, $p < 0.05$) and an increase in SE ($\beta = 0.999$, $p < 0.05$), adjusting for age and BMI. Time spent outdoors was not a significant predictor of sleep duration or efficiency.

Conclusions:

These preliminary data support acute effects of MVPA on sleep duration and efficiency. Although absolute time spent outdoors did not influence these relationships, further research is needed to discern effects of specific outdoor activities and light exposure.

O11.3**Driving you crazy and unhealthy: Understanding the associations of driving with health behaviors and outcomes****Authors:**

Ding Ding, Klaus Gebel, Philayrath Phongsavan, Adrian Bauman, Dafna Merom

Purpose:

Driving is a common part of modern society. Theoretically, driving may impair health through stress-response, competing time, and prolonged sitting. The specific effects of driving on health are not well understood. The present cross-sectional study examined the associations of driving time with a series of health behaviors and outcomes in a large population sample of middle-aged and older adults in Australia.

Methods:

Data were from the Social, Economic, and Environmental Factor Study, conducted in New South Wales, Australia in 2010. Participants ($n=37,570$; mean age 61.2 years, 54% female) reported usual daily driving time, health behaviors and outcomes using validated instruments. We examined the associations of driving time with six health behaviors (smoking, alcohol use, diet, physical activity, sedentary behavior, sleep) and six health outcomes (obesity, general health, quality of life, psychological distress, time stress, social functioning), adjusted for socio-demographic characteristics and locations of residence.

Results:

On average, participants drove 84 minutes on a usual day ($SD=82$). Longer driving time was associated with higher odds of smoking, insufficient physical activity, short sleep, obesity, poor health, poor quality of life, high psychological distress, time stress, and poor social functioning. The associations consistently showed a dose-response pattern with more than 120 minutes/day of driving having the most consistent associations with outcomes.

Conclusions:

This study highlights driving as a potential novel risk factor for public health. More population-level multidisciplinary research is needed to understand the mechanisms of how driving affects health. Public health and transportation interventions should consider strategies to reduce driving.

O11.4

Is the association of physical activity and sedentary behavior with CVD risk factors dependent on weight status? The NEXT generation health study

Authors:

Ronald Iannotti, Charlotte Pratt, Kaigang Li, Mary Ann D'Elia, Ruzong Fan, Bruce Simons-Morton

Purpose:

Associations of physical activity and sedentary behavior with adiposity and cardiovascular disease (CVD) risk factors may depend on weight status. The current study examines this hypothesis in a national sample of US adolescents.

Methods:

Height, weight, waist circumference (WC), fasting blood glucose, HbA1c, total cholesterol (TC), triglycerides, low density lipoprotein (LDL-C), high density lipoprotein (HDL), C-reactive protein (CRP), uric acid and systolic (SBP) and diastolic (DBP) blood pressure were assessed in 257 overweight/obese and 260 normal weight adolescents (mean age = 16.2±0.5). A minimum of 4 days of physical activity (PA) and sedentary behavior were assessed with accelerometers (wearing time ≥ 500 minutes/day). Data were analyzed with linear regression. Participants taking medications affecting these CVD risk factors were excluded from analyses.

Results:

Vigorous PA was related negatively to WC, LDL-C, CRP, and DBP, and positively to SBP and uric acid. Sedentary behavior was negatively related to WC and fasting blood glucose. On average, being overweight was related to less vigorous PA (4.76 min/day versus 6.73 min/day) and less sedentary behavior (507.3 min/day versus 525.1 min/day). Being overweight was also positively related to WC, TC, LDL, HDL, triglycerides, C-reactive protein, uric acid, and DBP. Weight status did not moderate associations with vigorous PA. However, in normal weight adolescents, there was a much greater negative association between sedentary behavior and fasting blood glucose.

Conclusions:

Vigorous PA and sedentary behavior were related to CVD biological markers although these associations were complex. The effects of sedentary behavior may depend on an adolescent's weight status.

O11.5

Noncustodial parents' influence on adolescents' weight and weight-related behaviors: Similar or different from custodial parents?

Authors:

Jerica Berge, Rich MacLehose, Craig Meyer, Marla Eisenberg, Dianne Neumark-Sztainer

Purpose:

Understanding whether and how custodial and noncustodial parents' weight and weight-related behaviors are correlated with adolescents' weight and weight-related behaviors will inform researchers as to which family member(s) may be important to include, or focus on, in obesity prevention interventions.

Methods:

Data from two linked population-based studies, EAT 2010 and F-EAT, were used for this cross-sectional analysis. Custodial parents (n=184; 80% females; mean age 42.3), noncustodial parents (n=184; 88% male; mean age 44.6), and adolescents (n=184; 53.2% girls; mean age 14.4 years) were socio-economically and racially/ethnically diverse. Multiple regression models were fit to investigate the association between custodial and noncustodial parents' weight and weight-related behaviors and adolescents' weight and weight-related behaviors.

Results:

Both custodial and noncustodial parents' BMI and dieting was significantly associated with adolescents' BMIz-score and dieting behavior. Custodial parents' fruit and vegetable intake and sugar-sweetened beverage consumption was significantly associated with adolescents' same behaviors compared to noncustodial parents. Noncustodial parents' weekly hours of physical activity was significantly associated with adolescents' physical activity compared to custodial parents. Neither custodial nor noncustodial parents' fast food consumption or breakfast intake were significantly associated with adolescents' same behaviors.

Conclusions:

Both custodial and noncustodial parents' weight and weight-related behaviors were significantly associated with adolescents' weight and weight-related behaviors, although there were more significant associations with custodial parents. Public health interventions may want to include a focus on how both custodial and noncustodial parents' weight and weight-related behaviors may influence adolescents' own weight and weight-related behaviors.

O11.6

The association between self-reported and objectively-measured physical activity for elementary school children: Are there gender differences?

Authors:

Guangxiang Zhang, Md Mahabub-Ul Anwar, Eve Kutchman, Christine A. Schaefer, Ray Browning, James Hill, Peter Anthamatten, Claudio R. Nigg

Purpose:

To examine gender difference in moderate to vigorous physical activity (MVPA) and the association between self-reported and objectively measured System for Observing Play and Leisure Activity in Youth (SOPLAY) data.

Methods:

Self-reported surveys were collected for 4-5th graders (n=1386, 51.34% female; mean age=10.22, SD=0.73 years; 58.82% Hispanic), randomly selected from eight Denver, CO, schools between 2010-2012. Using data collected by trained SOPLAY observers, we calculated the percentage of children engaged in MVPA in the schoolyards and per child energy expenditure rate(EER). Spearman correlations among aggregate school-level outcomes were run separately for each gender.

Results:

Boys spent more time in PA than girls: Mean (SD) of 62.15(11.08) vs. 50.88(7.37) min per day for self-reported data; 78.02%(4.76%) vs. 69.56%(7.70%) for measured percentage of children in MVPA; 0.11(0.01) vs. 0.10 (0.01) for measured EER (kcal/kg/min). Accordingly, a school had a likelihood of at least 83.30% (20/24) to have a higher activity level for boys than girls for all three activity indicators. The correlation between self-reported and measured MVPA% was moderately strong ($r=0.57$, $p<0.01$, $n=24$) for boys and weak ($r=-0.09$, $p=0.67$, $n=24$) for girls. Similarly, the correlation between self-reported and measured EER levels was also moderately strong ($r=0.54$, $p<0.01$, $n=24$) for boys and weak ($r=-0.16$, $p=0.46$, $n=24$) for girls.

Conclusions:

Self-reported leisure time MVPA levels can be validated by measured activity level in recess time for boys, but not for girls, indicating recess may not be enough of an opportunity for promoting PA for girls.

O11.7

Longitudinal relationships between physical activity enjoyment and behavior differ between women and men

Authors:

Eldin Dzibur, Yue Liao, Genevieve Dunton

Purpose:

While gender differences in physical activity levels have been well documented in the literature, reasons contributing to lower activity levels in females in adulthood are not completely known. One potential mechanism to consider is differences in enjoyment of physical activity. The primary purpose of the study was to examine the longitudinal directional relationships between physical activity behavior and enjoyment among men and women.

Methods:

Baseline and six month follow-up data were examined from 117 physically inactive adults (mean age = 41, SD = 9.8, 71.3% women, 30.4% Hispanic) living in Southern California. Enjoyment of moderate to vigorous physical activity (MVPA) was measured at each wave using a 6-item scale. MVPA was measured using a waist-worn Actigraph GT2M accelerometer for a period of seven days at each wave. The data was analyzed using a two-group two time-point latent change score structural equation model with cross-lags.

Results:

Results found that enjoyment of physical activity at time 1 was not related to change in MVPA at time 2 ($B = 1.05$, $p > 0.05$) for both genders. However, greater MVPA at time 1 was associated with a greater positive change in enjoyment of physical activity at time 2 ($B = 0.18$, $p < 0.05$) among women but not men ($B = -0.01$, $p > 0.05$).

Conclusions:

These findings may have implications to future behavioral interventions targeting women's physical activity, suggesting that encouraging inactive women to try physical exercise could provide a gateway to dispelling preconceived negative notions and attitudes toward physical activity.

Orals 12

Environmental Influences (Correlates) on Diet, PA and Sedentary Behavior

Moderator: Flo Harrison

Affiliation: Norwich Medical School, University of East Anglia, Norwich, UK

O12.1

Rainfall and physical activity; what happens as children age?

Authors:

Flo Harrison, Kirsten Corder, Ulf Ekelund, Esther van Sluijs, Andy Jones

Purpose:

Weather conditions, along with day length, are proposed as the main drivers of the seasonal patterns in children's physical activity (PA). This study examines the relationship between rainfall and PA among 9-10 year old children in Norfolk, UK, and how this changes as they age.

Methods:

Participants were 283 children from the SPEEDY study who wore accelerometers for up to seven days on three occasions. PA measurements were taken in the school summer terms of 2007, 2008 and 2011 when children were aged 9-10, 10-11, and 13-14 years old. Daily weather data were obtained for two local weather stations. Relationships between rainfall and minutes of moderate-to-vigorous-PA (MVPA; > 2000 cpm) were assessed in multiple-membership multilevel models allowing for clustering of days within children within both primary and secondary schools.

Results:

At ages 9-10 and 10-11 years, MVPA declined with increasing rainfall, with an average of 14.0 (SE 2.9)/11.4 (SE 3.0) minutes less MVPA on the wettest days (≥ 1.7 mm rain; 22% of study days) compared to dry days (0mm rain; 53%) respectively. There was no significant trend in MVPA across rainfall categories at age 13-14 years. Between ages 9-10 and 13-14, MVPA decline was largest on dry days (-15.2 minutes, SE 2.7).

Conclusions:

Increased rainfall is associated with significant decreases in MVPA among primary school children, but not secondary school children. MVPA declines most steeply between the ages of 9-10 and 13-14 on dry days. Interventions to increase activity on wet days in primary schools may help increase overall activity levels.

O12.2**Changes to the school food and physical activity environments between 2008 and 2012 among elementary and secondary schools****Authors:**

Allison Watts, Louise Masse, Patti-Jean Naylor

Purpose:

To examine school-level changes before and after implementation of the Food and Beverage Sales in Schools (FBSS) and Daily Physical Activity (DPA) guidelines in British Columbia, Canada.

Methods:

Elementary and middle/high school principals completed a survey on the school food and physical activity environment in 2008 (N=513) and 2012 (N=490). Hierarchical mixed effects regression was used to examine changes in: 1) availability of foods and beverages; 2) minutes per day of PE; 3) delivery method of PE; 4) policy implementation; and 5) school community support. Models controlled for school enrollment and community type, education and income.

Results:

After policy implementation, more elementary schools provided access to fruits and vegetables and less to 100% fruit juice. Among middle/high schools, fewer schools provided access to sugar-sweetened beverages, French fries, regular baked goods, regular salty snacks and chocolate/candy. Schools were more likely to meet 150min/week of PE for grade 6 students, and offer more minutes of PE per week for grade 8 and 10 students including changes to PE delivery method. Many schools were in the process of implementing policies; guidelines for fundraising and school events had the lowest levels of implementation. School community support for nutrition and physical activity policies increased over time.

Conclusions:

Positive changes to the school food environment occurred after implementation of the FBSS and DPA guidelines. Reported changes to the school environment are encouraging and provide support for guidelines and policies that focus on increasing healthy eating and physical activity in schools.

O12.3**Neighborhood and home environments and GPS-derived location-specific physical activity in adolescents****Authors:**

Jordan Carlson, Jasper Schipperijn, Jacqueline Kerr, Terry Conway, Brian Saelens, Lawrence Frank, Kelli Cain, James Sallis

Purpose:

To compare relations of neighborhood walkability and home equipment to (1) total and (2) location-specific physical activity.

Methods:

290 adolescents (M age=14.1±1.4 years; 45% girls; 74.7% White non-Hispanic) wore GPS and accelerometers for 5.4±1.9 days set to record at 30-second epochs. GIS was used to calculate a walkability index (sum of z-scores for density, mixed-use, connectivity, and retail floor-area-ratio) and classify GPS points as in-neighborhood (1km street network) or in-home (50m radius). MVPA was assessed using Evenson cut points, and home equipment (sum items of sports equipment) was self-reported. Three-level mixed effects linear regression (days, participants, neighborhoods) was used; Bs are MVPA minutes/day.

Results:

Participants had 5.7±3.9 hours/day of wear time and 5.5±1.8 minutes/day of MVPA in their home. In-neighborhood (out of home) wear time was 21±4 minutes/day and in-neighborhood MVPA was 1.9±2.2 minutes/day. Total MVPA was 30.2±1.3 minutes/day.

Walkability was not associated with total or in-neighborhood MVPA until adjusting for time spent in-home and in-neighborhood (Bs=0.9). Home equipment was associated with total and in-home MVPA (Bs=1.6; 2.2). Adjusting for time spent in home strengthened the association between equipment and total MVPA (B=1.9) and attenuated the association between equipment and in-home MVPA (B=1.5).

Conclusions:

Assessing physical activity and time spent in specific locations with GPS provides improved specificity for investigating relations of environments to physical activity. Proportional effect sizes were much stronger for location-specific than total MVPA. Assessing environmental exposure in multiple locations should lead to an improved understanding of environmental influences on total physical activity.

O12.4**Assessing the impact of a new fast food development on eating behaviors and perceptions: A natural experiment****Authors:**

Lukar Thornton, Kylie Ball, David Crawford

Purpose:

A common opposition to the development of new fast food outlets is the potential negative health impacts; however, causal evidence for this is rare. This study aims to assess the impact of a new fast food development on the eating behaviors and perceptions of local residents using a natural experiment design.

Methods:

The site for this study was Tecoma, Australia, a small town on the outer fringe of Melbourne. Prior to the new McDonald's store, the nearest outlet was approximately 8km away. Baseline data was collected in December 2012 on eating behaviors and perceptions of the local environment on 242 Tecoma residents and 183 residents from a control site (Monbulk). McDonald's is due to open in late 2013 and surveys will be redistributed 3- (~March 2014) and 12-months post the opening of the store with time-series analysis used to assess change.

Results:

Around 80% of residents from both sites reported they did not eat McDonald's products during the last month with even higher percentages for other fast foods (e.g. ~90% for KFC and Hungry Jacks). Residents from both sites reported strong agreement that takeaway products were already easily accessible in their neighbourhood, though many believed that their town did not currently have a lot of rubbish/litter.

Conclusions:

Natural experiments have been proposed as a priority area for food environment research. Evidence generated from this study will be used to assess the causal impact of a new fast food restaurant development on the eating behaviors and perceptions of local residents.

O12.5

Putting the person back into neighborhood food environment

Authors:

Margaret Demment, Meredith Graham, Christine Olson

Purpose:

In the US, there is a strong association between demographics and neighborhood environment. Yet, few studies have examined how demographics in relation to food environment contribute to diet. The objective of this study is to examine if the perceived food environment mediates the association between a woman's demographic profile and her fruit and vegetable (F&V) consumption.

Methods:

This study employs two sources of data from a sample of racially and socioeconomically diverse pregnant women (n=1689): 1) recruitment data and 2) surveys, completed by 78% of the sample (n=1325). The independent variable, demographic profile, derived through latent-class analysis, used these recruitment variables: BMI category, race, ethnicity, age, and low-income. The mediating variable was derived from a woman's survey responses to the perceived quality and selection of fresh fruit and vegetables in her neighborhood using a Likert scale. The outcome was derived from self-reported F&V consumption. Preliminary results analyzed change in Wald Chi-square statistics while future analysis will include mediation models using PROCESS in SAS to explore our objective.

Results:

In a preliminary logistic model, both perceived quality of F&V and demographic profile were significantly associated with F&V consumption. When perceived quality is added to the model the Wald Chi-square statistic for profile decreases from 60.6 to 30.4, suggesting that quality partially mediates the relationship between profile and F&V consumption.

Conclusions:

Teasing apart individual and neighborhood contributions to diet are challenging. The findings from this study will help us better understand the role of each in a diverse sample of women.

O12.6

The role of family, friend and coworker support in weight gain prevention among a school employee sample

Authors:

Monica Wang, Lori Pbert, Stephenie Lemon

Purpose:

To examine the longitudinal associations between various sources of support (family, friends, and coworkers) to eat healthy and be physically active and weight among school employees participating in a weight gain prevention intervention.

Methods:

Data are from 782 adults employed across 12 public high schools participating in a cluster-randomized multilevel weight gain prevention intervention. Primary predictors of interest included summary scores of support for two types of behaviors (eating healthy and being physically active) from three support sources (family, friends, and coworkers) obtained via self-administered surveys. The primary outcome (weight in pounds) was measured by trained staff. Data were collected at baseline and two follow-up time points (12 and 24 months). Linear mixed effects models examined the association of all three support sources with weight, adjusting for intervention status, time, gender, age, and clustering of individuals within schools.

Results:

Multivariable models indicated that friend support for healthy eating predicted weight loss at 24 months ($\beta=-0.2$; $p=0.03$), whereas family and coworker support did not. With respect to physical activity, family ($\beta=-0.8$; $p=0.02$) and friend support ($\beta=-0.09$; $p=0.03$) were associated with weight loss, but coworker support was not. When support for

both behaviors from all three sources were included, only friend support for physical activity ($B = -0.8$; $p = 0.04$) was associated with weight loss.

Conclusions:

Findings suggest that among adult employees, friends may comprise a key source of influence in providing support for weight management behaviors, particularly physical activity, associated with weight loss.

Orals 13 Sedentary Behavior

Moderator: Eileen Johnson

Affiliation: Department of Family & Preventive Medicine, University of California, San Diego, San Diego, CA, USA

O13.1

Objective measurement of screen time in overweight women with different working status

Authors:

Eileen Johnson, Lu Wang, Gina Merchant, Jacqueline Kerr, Simon Marshall

Purpose:

To explore how objectively measured screen time and time spent in concurrent sedentary behaviors differed among non-full time and full-time working women.

Methods:

Twenty-two overweight/obese women (ages 22-82) wore a SenseCam for 1-7 days. Image data were annotated using standardized protocols to determine: Sedentary posture, presence of a TV, presence of another screen, and presence of another sedentary activity while watching TV or another screen. Participant days ($N = 102$) with > 10 -hours of device wear were stratified by work status and day of week. Linear mixed effects models tested whether employment status, day of the week, and day of the week*employment status predicted (1) TV, (2) Other screen, (3) TV+. A random intercept accounted for the non-independence of days within participants.

Results:

Mean sedentary time for all participants was 7.8 ± 2.6 hrs.dy-1. Significant interaction terms ($p < .01$) indicated women had different patterns of screen time based on work status and day of week. Weekend TV time was greater among fulltime-employed ($M = 4.93$; $SE = 0.86$ hrs.dy-1) compared to non-fulltime employed women ($M = 3.27$; $SE = 0.73$ hrs.dy-1), whereas weekday Other-screen time was greater among fulltime-employed ($M = 4.85$; $SE = 0.54$ hrs.dy-1) compared to non-fulltime employed women ($M = 2.29$; $SE = 0.68$ hrs.dy-1). Both groups spent more time multitasking while watching TV on weekend days.

Conclusions:

Employment status affects the distribution of screen time across week vs. weekend days. Interventions to decrease sedentary screen time among women could benefit from tailoring to work status and the intervention setting (e.g., home vs. at work).

O13.2

Where do cardiac rehabilitation patients engage in sedentary behavior? An accelerometer / GPS approach

Authors:

Chris Blanchard, Daniel Rainham, Nicholas Giacomantonio, Tim Jason, Jessie MacKay

Purpose:

Research in non-diseased populations has shown that increased sedentary behavior is negatively related to several health-related outcomes, which we have confirmed in cardiac rehabilitation patients (CR). However, an important issue

to address from an intervention perspective is to identify the various contexts that sedentary behavior occurs. Therefore, the purpose of the present study was to identify where patients engage in sedentary behavior during CR.

Methods:

Patients from our ongoing trial (i.e., ENCORE) were asked to wear an accelerometer + GPS unit for 9 days at the beginning and end of CR. The 1st and last days were removed for each patient to obtain 7 full days of recording. The accelerometer and GPS data were linked using our GAP software at 5-sec epochs. Linked data were then combined into 3 categories (i.e., sedentary done in the patient's home, outside the home, but within his/her neighborhood, and outside his/her neighborhood).

Results:

To date, we have analyzed 100 patients' records from the beginning of CR assessment, which is presented here. Results showed that 53.7% of their sedentary behavior took place in their homes, 3.88% took place outside their homes within their neighbourhoods (i.e., within a 15-min walk for urban or 15 min drive for rural patients), and 42.37% took place outside of their neighbourhood boundaries.

Conclusions:

It appears that sedentary behavior at the beginning of CR occurs primarily within the patients' home or outside of their neighborhoods. Whether this remains stable as patients progress through CR needs to be confirmed.

O13.3**People with high use of online social networks sit more but are not less active than people with low usage of online social networks****Authors:**

Corneel Vandelanotte, Amanda Rebar, Mitch Duncan, Camille Short

Purpose:

The popularity of online social networks (e.g. Facebook) provides ideal opportunities to engage people into web-based health behavior change interventions. However, little is known about the physical activity and sitting time levels of those that might be easiest reached through an online social network (the heavy users). The purpose of this study was to examine sitting and activity levels between those who frequently use online social networks and those who do not.

Methods:

Physical Activity (Active Australia Survey) and Sitting time (Workforce Sitting Questionnaire) were assessed in a phone-administered (CATI) survey in 1293 participants. Three items assessed the usage of, the importance placed on, and the number of connections ('friends') people have in online social networks. Group difference were tested with ANOVA's, controlling for socio-demographic factors.

Results:

Only 42.7% of participants were sufficiently active, and 34.7% were sitting more than 8 hours/day. Those who used online social networks daily (31.1%), who placed high importance on (26.4%), and who had a high number of connections (more than 100) in online social networks (18%) were sitting significantly more than those who used online social networks less frequently ($F(2)=10.1; p<0.00$), placed low importance on ($F(1)=4.3; p<0.05$), and had fewer connections in online social networks ($F(2)=4.5; p<0.01$). No significant differences were observed for physical activity outcomes.

Conclusions:

People who are heavily engaged with online social networks should be targeted in web-based interventions to reduce sitting time. However, given the overall low prevalence of physical activity they would also benefit from interventions to increase physical activity.

O13.4

Cross-sectional association between occupational sitting and BMI in a diverse sample of employees in midwest metropolitan areas

Authors:

Lin Yang, Aaron Hipp, Christine Marx, Ross Brownson

Purpose:

Excessive body weight is associated with various chronic diseases leading to high healthcare and economic burden. Sedentary time has been linked to the likelihood of obesity. However few studies have examined occupational sitting specifically and there is a lack of evidence for this association in diverse populations. To quantify the association between self-reported occupational sitting time and BMI between gender and racial groups, independent of level of occupational and leisure-time physical activity.

Methods:

Between 2011 and 2012, participants residing in four Missouri metropolitan areas in the Worksite Policies and Neighborhood Influence on Obesity and Cancer Risk study were interviewed via phone. Multinomial logistic regressions were used to examine the association between occupational sitting and BMI by gender and by race in women.

Results:

Overall 1,891 participants (67.0% women, 29.5% African American) provided complete data. Study participants reported 218.4 (± 209.7) minutes daily occupational sitting, with majority being overweight (32.3%) or obese (34.1%). For African American women, reporting longer occupational sitting is associated with around 2.5-fold higher likelihood (p for trend=0.02) of being obese compared to those who reported sitting less than 30 minutes, independent from occupational and leisure-time physical activity and adjusting for numerous potential confounders. The association was not seen in white women. No associations were found in men.

Conclusions:

Reducing occupational sitting may be an important strategy for weight management, particularly in African American women. Further research needs to investigate this association in prospective cohorts and to explore the feasibility of conducting worksite interventions targeting sitting behavior.

O13.5

Are the correlates of television viewing, computer use and objectively measured sedentary time similar?

Authors:

Suvi Määttä, Teija Nuutinen, Carola Ray, Johan Eriksson, Elisabete Weiderpass, Eva Roos

Purpose:

This study investigated the individual, parental, and physical environmental correlates associated with self-reported ('reported') and objectively measured ('recorded') out-of-school sedentary time (ST) in a sample of 11-year-old children.

Methods:

In spring 2013, a total of 155 children wore an accelerometer seven days and completed questionnaire of television viewing, computer use and potential correlates (e.g. physical activity (PA), parental PA). Parents informed education in consents. Children's weight was measured before use of accelerometers. Weather information was collected from each day of accelerometer use. Reported ST included separate continuous measures of television viewing and computer use. Linear regression analyses independently for weekdays and weekend were applied.

Results:

Only the reported and recorded PA had an inverse association with both recorded and reported ST meaning that children who recorded more ST and reported more computer use and television viewing had less PA. Most of other corre-

lates were associated with either reported or recorded ST. Lower educated parents and being overweight were associated with television viewing in weekdays, whereas lower educated mothers and computer use were associated with television viewing in weekends. Being a boy, television viewing, and less perceived parental PA were associated with computer use in weekdays and weekends. The colder temperatures at 8pm and being a girl were associated with high recorded ST.

Conclusions:

Different types of sedentariness have distinctive correlates. Future studies should include several sedentary behaviors to form a complete picture of significant correlates. A combination of recorded and reported measurements might be beneficial.

O13.6

The independent prospective associations of sedentary time, moderate and vigorous physical activity with adiposity in young adolescents

Authors:

Esther van Sluijs, Stephen Sharp, Gina Ambrosini, Ulf Ekelund

Purpose:

To assess the associations between 1) baseline objectively-measured activity intensity (sedentary (SED), moderate (MPA) or vigorous (VPA) activity) and 4-year change in adiposity, and between 2) 4-year change in activity intensity and adiposity at follow-up.

Methods:

Analyses of longitudinal data from the SPEEDY study, including all participants with valid data at baseline and 4-year follow-up for objectively-measured activity (Actigraph accelerometer), measured anthropometry (waist circumference (WC), %body fat (%BF), and fat mass index (FMI)), and covariates (age, sex, birth weight, dietary energy density (4-day food diary), accelerometer registered time, maternal BMI, socio-economic status, and sleep). Linear regression models with robust standard errors to account for clustering by school were fitted, interactions with sex and baseline obesity status explored.

Results:

367 participants were included (48% boys, baseline age 9-10 years). Baseline SED was not associated with change in WC (B per 10-minute increase; 95%CI: -0.11;-0.27:0.04), %BF (-0.02;-0.10:0.07), or FMI (-0.03;-0.16:0.10). All models were attenuated but remained non-significant after adjustment for moderate-to-vigorous PA. Similarly, baseline MPA and VPA were not associated with change in WC (MPA: 0.41;-0.14:0.96, VPA: 0.21;-0.20:0.62), %BF (MPA: 0.04;-0.24:0.31, VPA: 0.07;-0.17:0.31), or FMI (MPA: 0.12;-0.23:0.46, VPA: 0.00;-0.24:0.25), adjustment for SED did not change conclusions. Change in SED, MPA and VPA did not predict anthropometry at follow-up. Results did not differ by sex or baseline obesity status.

Conclusions:

Objectively-measured activity intensity was not prospectively associated with adiposity in this adolescent cohort. Future research should continue to explore the importance of activity intensity on changes in adiposity, to inform intervention efforts.

Orals 14 Interventions in Adults

Moderator: Cristina M Caperchione

Affiliation: University of British Columbia, Kelowna, Canada

O14.1

What happens when a physical activity and nutrition intervention is translated to the ‘real world’? Using RE-AIM to examine community translation of the ManUp intervention

Authors:

Cristina M Caperchione, Mitch Duncan, Gregory S Kolt, Corneel Vandelanotte, Richard R Rosenkranz, Anthony Maeder, Manny Noakes, W Kerry Mummery

Purpose:

Real-world translation of interventions tested by tightly controlled research trials is an important health promotion objective. Using the RE-AIM framework, this study examined the community translation of the ManUp intervention, a physical activity (PA) and nutrition lifestyle intervention already tested by randomised control trial.

Methods:

Data were collected for each RE-AIM measure (Reach, Effectiveness, Adoption, Implementation, Maintenance) using computer assisted telephone interview survey (N=312), interviews with key stakeholders from local organizations (n=12), and examination of project-related statistics and findings.

Results:

In terms of Reach, 47% of participants were aware of the intervention. For Effectiveness, there were no significant differences between PA and healthy nutrition in those aware and unaware of the intervention. Regarding Adoption, 73 participants registered for the intervention and 25% of organizations adopted some part of the intervention. For Implementation, 26% of participants initially logged onto the website, 29% and 17% started web-based PA and nutrition challenges, 33% of organizations implemented the intervention, 42% considered implementation, and 25% reported difficulties with implementation. Regarding Maintenance, an average of 0.57 logins and 1.35 entries p/wk during the 12-week dissemination and 0.27 logins and 0.63 entries p/wk during the 9-month follow-up were achieved. Further, 22% and 0% of participants completed the web-based PA and nutrition challenges, respectively, and 33.3% of organizations intended to keep the intervention as part of their workplace health initiative.

Conclusions:

While this intervention demonstrated good reach, it was apparent that effectiveness, adoption, and implementation were not strong, and thus warrant further consideration and investigation.

O14.2

How effective are active videogames among the young and the old? A meta-analysis of two recent systematic reviews

Authors:

Jonathan Van 't Riet, Rik Crutzen, Amy Shirong Lu

Purpose:

Two recent systematic reviews have surveyed the existing evidence for the effectiveness of active videogames in children and adolescents, and in elderly people. In the present study, effect sizes were added to these systematic reviews and meta-analyses were performed.

Methods:

All reviewed studies were considered for inclusion in the meta-analyses, but only studies were included which investigated the effectiveness of active videogames, employed a (quasi-) experimental design, and used BMI as the outcome measure in the children/adolescents domain (N=5), or physical function in the elderly domain (N=7).

Results:

No considerable heterogeneity in the effect sizes was observed for the effects of active videogames on BMI in children and adolescents. The average effect of active videogames in children and adolescents was small, but significant ($r = .10$; 95% CI: $.02 - .19$). For the effect of active videogames on physical function in the elderly, significant heterogeneity was observed. The analyses revealed a medium-sized, but non-significant effect of $r = .26$ (95% CI: $-.33 - .85$). Intervention duration, study quality and dropout moderated the intervention effect, such that longer interventions, better studies and studies with smaller dropout rates found larger effects.

Conclusions:

The results of this meta-analysis provides preliminary evidence that active videogames can have positive effects on relevant outcome measures in both children/adolescents, and elderly individuals. In future, meta-analytic procedures are indispensable to evaluate active videogames' effectiveness and to identify additional moderators.

O14.3

Diabetes prevention in the real world: Systematic review and meta-analysis of the effectiveness of pragmatic lifestyle interventions for the prevention of type 2 diabetes and of the impact of guideline recommendations on effectiveness

Authors:

Colin Greaves, Alison Dunkley, Danielle Bodicoat, Claire Russell, Thomas Yates, Melanie Davies, Kamlesh Khunti

Purpose:

Community based diabetes prevention interventions vary dramatically in effectiveness. We aimed a) to summarise the evidence on effectiveness of 'real-world' diabetes prevention programmes, and b) to examine whether adherence to international guideline recommendations is associated with increased effectiveness.

Methods:

Relevant bibliographic databases were searched to July 2012. Included studies had a follow-up of at least 12 months and outcomes comparing changes in body composition, glycaemic control, or progression to diabetes. Lifestyle interventions aimed to translate evidence from previous efficacy trials of diabetes prevention, into real world intervention programmes targeting change in diet and /or physical activity. Data were combined using a) random effects meta-analysis and b) meta-regression to explore the association between intervention effectiveness and adherence to NICE and IMAGE recommendations on intervention content.

Results:

The primary meta-analysis included 22 studies with outcome data for weight loss at 12 months. This showed that lifestyle interventions delivered a mean weight loss of 2.12kg (95% CI: 2.61 to 1.63; $I^2=91.4\%$). This compared with 4.2 to 6.7Kg achieved in 'gold standard' clinical efficacy trials. Adherence to guidelines was significantly associated with greater weight loss, with an increase of 0.3Kg per point increase on a 12-point guideline-adherence scale.

Conclusions:

Current, pragmatic diabetes prevention programmes are effective. Effectiveness varies substantially between programmes, but is higher for programme that adhere to guideline recommendations on supporting behavior change.

O14.4

The potential cardio-metabolic benefits of replacing time in less-for more-active behaviors in adults with type 2 diabetes

Authors:

Genevieve Healy, Elisabeth Winkler, Charlotte Brackenridge, Marina Reeves, Elizabeth Eakin

Purpose:

To examine the cross-sectional associations of objectively derived physical activity and sedentary time with cardio-metabolic biomarkers, including the potential collective impact of shifting time use from less towards more active behaviors.

Methods:

Overweight/obese and/or physically inactive adults with type 2 diabetes (n=294; mean age = 58.0 [SD 8.5] years) wore Actigraph GT1M accelerometers for seven days to assess moderate-to-vigorous physical activity (MVPA), light-intensity activity, and sedentary time (segregated into non-prolonged [sedentary time accumulated in bouts <30mins] and prolonged [sedentary time accumulated in bouts ≥30mins]). Using isotemporal modelling, associations of these activity variables (30 mins/day increments) with waist circumference, BMI, fasting blood (HbA1C, glucose, triglycerides, HDL-cholesterol), and blood pressure were examined: In isolation (adjusted for confounders); independently (also adjusted for other activities); and, interdependently (i.e., by reallocating time from less- to more-active behaviors).

Results:

Significant ($p < 0.05$) associations (in isolation) were observed with waist circumference and BMI for prolonged (detrimental) and non-prolonged (beneficial) sedentary time, and with diastolic blood pressure (beneficial) for non-prolonged sedentary time. No outcome was significantly associated with light-intensity activity or MVPA. Reallocating 30 mins/day of prolonged sedentary time to either non-prolonged sedentary time or light-intensity activity was associated with significantly lower average waist circumference and BMI. Associations were strongest when considered interdependently.

Conclusions:

Additional to existing physical activity messages, shifts away from prolonged sedentary time (e.g., getting up at least every 30 minutes) should be investigated as a potentially achievable strategy to improve body composition in adults with type 2 diabetes.

O14.5

The CHANGE program: Comparing an interactive versus prescriptive approach to self-management among university students with obesity

Authors:

Erin S. Pearson, Jennifer D. Irwin, Don Morrow, Danielle S. Battram, C. W. James Melling

Purpose:

To assess the effectiveness of two self-management (SM) approaches on obesity via a 12-week telephone-based intervention. An interactive Motivational Interviewing approach administered via Co-Active Life Coaching (MI-via-CALC), and a structured lifestyle treatment following the LEARN Program were compared. A secondary purpose was to explore participant experiences qualitatively.

Methods:

For this mixed methods study, university students aged 18-24 with a Body Mass Index $> 30\text{kg/m}^2$ (n = 45) were randomized to either the: a) MI-via-CALC condition which involved working with a certified coach to achieve goals through dialogue; or b) LEARN Program which entailed learning from a specialist who provided scripted lessons pertaining to lifestyle, exercise, attitudes, relationships, and nutrition. Dietary patterns, anthropometrics, and lipid profiles were examined at baseline, mid-, and immediately post-treatment, and 3- and 6-months following the program using repeat-

ed measures ANOVAs. A semi-structured questionnaire was completed at all follow-ups and analyzed using inductive content analysis.

Results:

Analyses revealed a significant time effect for weight ($p = .01$) with the LEARN group decreasing more ($M = -7.76\text{lb}$) than the MI-VIA-CALC group ($M = -2.5\text{lb}$) between baseline and week 12. MI-via-CALC participants decreased caloric intake more ($M = -662.76$) than LEARN participants ($M = -105.5$) during this same period. The MI-via-CALC group focused on self-understanding/responsibility as primary outcomes of their experience; the LEARN group stressed appreciation of practical knowledge gained.

Conclusions:

Both conditions appear similarly effective and are warranted as SM treatments. The best-fit and unique contributions of each approach should be considered when working with this population.

O14.6

An exploration of cognitive and environmental factors as mediators of the effects of two versions of a web-based, computer-tailored nutrition education intervention

Authors:

Linda Springvloet, Lilian Lechner, Anke Oenema

Purpose:

The aim of this study was to explore the variables that may mediate the effects of two versions of a computer-tailored nutrition education intervention. The basic version targeted psychosocial processes only; the plus version additionally provided tailored environmental feedback.

Methods:

A randomized controlled trial was conducted among 1,348 adults. Outcome measures were: Fruit, vegetable, high-energy snack and fat intake. Potential mediators were: awareness, intention, attitude, self-efficacy, subjective norm, action-planning, coping-planning, perception of availability and price of healthy food products in supermarkets and availability and location of products at home. All measures were assessed using online questionnaires. Intake measures were assessed at baseline and 4-months post-intervention. Potential mediators were assessed at baseline and 1-month post-intervention. The joint-significance test was used to establish mediation for each outcome measure. Both intervention groups were compared with a generic nutrition information control group. Participants who did not comply with guidelines regarding fruit, vegetable, high-energy snack and fat intake at baseline were included in the analyses.

Results:

The joint-significance test showed that only availability of fruit at home was a mediator of the effect of the plus version on fruit intake (path-a: $\beta=0.090$, $p=0.030$; path-b: $\beta=0.178$, $p=0.004$). No evidence was found for mediating effects of other constructs or for other outcome measures.

Conclusions:

These preliminary results showed that improved availability of fruits at home can (partially) explain the effect of the plus version of the intervention on fruit intake. Reasons for not finding other variables as mediators will be discussed.

O14.7

Can professional rugby clubs attract male rugby fans to join a healthy lifestyle programme: The RuFIT study

Authors:

Cindy M Gray, Graham Brennan, Kate Hunt, Nanette Mutrie, Sally Wyke

Purpose:

Professional football clubs are increasingly seen as settings that can attract men to health promoting activities. The Football Fans in Training (FFIT) programme has successfully supported men in achieving clinically-significant weight loss

over 12 months. FFIT engaged men who would not otherwise attend weight management programmes; it harnessed an initial desire to 'do something' about their weight, fitness and health with participants' often deep symbolic and cultural attachments to their football club. However, the appeal of football is not universal, and we wished to test whether the model could be translated to a different setting. The Rugby Fans in Training (RuFIT) programme aims to attract male rugby supporters and enhance longer-term weight loss and lifestyle change through additional theoretically-based maintenance strategies.

Methods:

A mixed-methods feasibility study at an English Premiership Rugby Club targeting men (35-65yrs, BMI \geq 28kg/m²). Objective measurement, questionnaires, observations and focus groups assessed recruitment and engagement with RuFIT.

Results:

A short (3 week) recruitment period using club-based social media and online advertising resulted in 47 men registering interest for 23 places. Men attending RuFIT cited losing weight as the most important reason for joining (43.5%), followed by fitness, lifestyle (both 26.1%) and health (13.0%). Their mean age was 43.1(SD \pm 7.5), BMI 35.2(SD \pm 4.7)kg/m² and waist circumference 114.8(SD \pm 9.9)cm.

Conclusions:

RuFIT had high appeal among its target population and attracted very high-risk men. Qualitative methods and follow-up measurements will assess ongoing engagement with RuFIT, and its potential effectiveness in helping men lose weight, increase physical activity and improve their diet.

Orals 15

Motivation for PA in Children and Adolescents

Moderator: Ian Taylor

Affiliation: Loughborough University, Leicestershire, UK

O15.1

Self-determined motivation moderates the decline in physical activity over the UK school transition

Authors:

Ian Taylor, Christopher Spray, Natalie Pearson

Purpose:

Although average rates of physical activity behavior in UK children may decline over the transition from primary to secondary school, it is important to identify children who decline more (or less) than others. Therefore, we aimed to examine the different types of motivation (according to self-determination theory) in school Physical Education (PE) contexts as moderators of general declines in physical activity.

Methods:

Five hundred and forty-five students aged between 10 and 12 years-old (51% female) completed self-report measures of motivation towards PE and physical activity behavior at the end of primary school, the beginning of secondary school, and six months into secondary school. Multilevel growth models were constructed to test study hypotheses.

Results:

Students higher in intrinsic motivation reported more physical activity at the beginning of the study ($b = .22$, $p < .001$) and less of a decline across the transition ($b = .06$, $p = .01$), compared to students low in intrinsic motivation. Similar associations were found for students holding identified motives (initial levels: $b = .26$, $p < .001$, difference in decline: $b = .05$, $p = .05$). Introjected and external regulations were associated with physical activity levels ($b = .08$ and $b = -.09$, both $p < .001$) but these motives did not moderate declines in physical activity over the study ($b = .04$ and $b = .00$, both $p > .05$).

Conclusions:

Self-determined motives may hold protective properties against the often observed declines in physical activity over the challenging transition from primary to secondary school.

O15.2**Improving obese adolescents' physical activity behaviors by targeting parent need-supportive behaviors****Authors:**

Ashley Fenner, Leon Straker, Erin Howie, Kyla Smith, Martin Hagger

Purpose:

Need-supportive environments are proposed in self-determination theory to positively predict autonomous motivation underlying behavior engagement, yet few interventions have explored training parents in need-supportive behaviors to foster changes in adolescent physical activity. Findings are presented from the Curtin University's Activity, Food and Attitudes Program (CAFAP), which trained parents to be need-supportive.

Methods:

Parents were trained within an 8-week multi-disciplinary family-centred lifestyle intervention. Fifty six adolescent/parent pairs attended the intervention across three waves, staggered at 3-month intervals at three community sites. Measures included modified versions of the Revised Behavioral Regulations and Exercise Scale and the Integrated Regulation Scale for Exercise Behavior; Perceived Autonomy Support Scales for Exercise Settings; and adolescents wore Actical accelerometers. Linear mixed models using bootstrapped standard errors were used to assess within-person changes.

Results:

Parent autonomous motivation for supporting adolescent physical activity improved pre- to post-program ($p=.002$), but was not maintained at 6-months post-program. Parent-reported demonstration of need-supportive behaviors also improved at post-program ($p=.001$), but was not maintained at 6-months. Adolescent reports of parent need-supportive behaviors for physical activity were improved pre- to post-program ($p<.001$), and these differences were maintained at 6-months. Adolescent autonomous motivation for physical activity improved pre- to post-program ($p=.003$), and improvements were maintained at 6-months. Although not significant, improvements were shown in adolescent light and moderate to vigorous physical activity.

Conclusions:

Targeting parent need-supportive behaviors can be an effective means for improving parent autonomous motivation and demonstration of need-supportive behaviors, as well as adolescent autonomous motivation and perceptions of parent need-support.

O15.3**Analysing the effect of a school-based intervention on physical activity and quality of life through serial mediation of social support and exercise motivation****Authors:**

António Quaresma, António Palmeira, Cláudia Minderico, Sandra Martins, Luís Sardinha

Purpose:

This study aimed to explore the effects of social support and exercise motivation on physical activity (PA) and quality of life (QoL), in a two year school-based intervention. We hypothesised that serial mediation effects will be present, in which the intervention influences social support, which in turn influences more autonomous forms of motivation leading to greater levels of PA and QoL.

Methods:

The sample comprised 1052 students (534 boys), aged 10-16y, $BMI=20.5\pm3.7$, allocated to 2 groups of schools: Control

(n=207) and intervention (n=845). This study will report the 24 months results of the program, which aimed the development of healthy lifestyles. Questionnaires were used to measure PA, QoL, motivation to exercise and social support. Serial mediation analysis was conducted with residuals scores to represent change from baseline to 24 months.

Results:

Social support ($p<.019$) and intrinsic motivation ($p=.085$, marg. sig.) scores increased more on the intervention group. Indirect effects were observed in eight serial mediation models. The positive effect of the intervention on PA and QoL was explained by the increase on peer or parent support in serial with the increase in intrinsic motivation ($p<.01$). The QoL models showed that parental support lead to an increase on external motivation to exercise ($p<.05$), which buffered the positive effect of the intervention on QoL.

Conclusions:

A school-based intervention in the 10-16y age group promoted the development of social support and motivational mechanisms that explained higher levels of PA and QoL.

O15.4**Calibrating Walk Score to predict objectively-measured physical activity****Authors:**

Lawrence Frank, Jared Ulmer

Purpose:

The objective of this research (funded by the Robert Wood Johnson Foundation) was to calibrate the Walk Score (www.walkscore.com) algorithm to better predict objectively-measured physical activity for four age cohorts (children, adolescents, adults, seniors).

Methods:

Walk Score data were obtained for the home address of participants in four previous studies funded by the National Institutes of Health. For each participant, previously obtained data included demographic, socioeconomic, motivational, and physical activity as measured by accelerometer. Methods including factor analysis and multiple regression were used to identify and weight predictors of physical activity from the available Walk Score data.

Results:

Using network rather than airline-based distance measurement to destinations improved physical activity prediction. Distance decay functions, which describe the likelihood of walking to a destination as the distance increases, were nonlinear and varied by age cohort. Destination weights were re-calibrated to devalue those with high spatial correlation, such as retail destinations. Distance to the nearest cafe was the most consistent destination predictor across all cohorts, with other destinations varying by cohort. Street connectivity and Transit Score were also found to be strong predictors of physical activity in most cohorts. The calibrated Walk Score algorithm improved physical activity prediction in all four cohorts as compared to the original algorithm, and the association between the calibrated Walk Score and physical activity was significant ($p<0.002$) in all but the child cohort ($p=0.12$).

Conclusions:

Calibrating Walk Score using objectively-measured physical activity data improves the validity of its use for public health activities and academic research.

Orals 16

School-based PA Interventions

Moderator: Michael Beets

Affiliation: University of South Carolina, Columbia, South Carolina, USA

O16.1

From policy to practice: Strategies to meet physical activity standards in YMCA afterschool programs

Authors:

Michael Beets, Robert Weaver, Justin Moore, Gabrielle Turner-McGrievy, Russell Pate, Collin Webster, Aaron Beighle

Purpose:

To evaluate strategies designed to help afterschool programs (ASPs) meet the policy goal of accumulating 30min of moderate-to-vigorous physical activity (MVPA) each day at the program.

Methods:

A single group intervention with pre-test and three follow-up measures repeated-cross-sectional design with a sub-sample cohort took place in four large-scale YMCA ASPs, serving 500 children/day. Community-based participatory development of strategies focused on modification of program schedules, professional development training, and weekly checklists to evaluate activity opportunities. Accelerometry-derived MVPA classified as meet or fail-to-meet the 30min/d MVPA standard collected over a minimum of 4 non-consecutive days at baseline (Fall 2011) and 3 follow-up assessments (Spring 2011, Fall 2012, Spring 2013). Random intercept logistic regression models evaluated the probability of meeting the standard for boys and girls, separately.

Results:

A total of 895 children (5-12yrs, 48.4% girls) representing 3,654 daily measures were collected across the 4 assessments. The percentage of girls and boys meeting the MVPA standard at baseline was 13.3% and 28.0%, respectively. By Spring 2013 this increased to 29.3% and 49.6%. These changes represented an increase in the odds of meeting the 30min MVPA/d standard by 1.5 (95CI 1.1 to 2.0) and 2.4 (95CI 1.2 to 4.8) for girls and boys, respectively.

Conclusions:

The strategies developed herein represent an effective approach to enhancing current practice within YMCA ASPs to achieve existing MVPA standards. Additional work is necessary to identify the cost associated with using the strategies, as well as, evaluating the scalability of the strategies in a larger sample of ASPs.

O16.2

Do health promotion programs reduce or exacerbate inequalities in physical activity?

Authors:

Kerry Vander Ploeg, Jonathan McGavock, Katerina Maximova, Paul Veugelers

Purpose:

Weekends have been identified as critical-windows for health promotion. We aimed to determine whether school-based health promotion programs affect children's weekend activity levels and whether they reduce or exacerbate physical activity inequities.

Methods:

This was a quasi-experimental trial of school-based programs implemented in schools in disadvantaged neighborhoods in Alberta, Canada. In 2009 and 2011, pedometer (7 days) data was collected from cross-sectional samples of grade 5 students from 10 intervention and 20 comparison schools. Parents reported their socioeconomic status. Low-active, active, and high-active children were defined according to step-count tertiles. Multilevel models assessed the inequity in step-counts between groups over-time.

Results:

In 2009, relative to those attending comparison schools, children from intervention schools were less active on week-ends (9048 vs. 11216 steps/day $p < 0.01$). Two years later, activity levels of children from intervention schools increased such that they approximated those of children from comparison schools (12148 vs. 12121 steps/day $p = .96$). The relative difference in steps between intervention and comparison schools on weekends reduced from -21.4% to 0%. They also reduced from -43% to -16%, -27% to +3.2%, and -14% to +2.7% among low-active, active, and high-active students, respectively. Further, the difference reduced from -21% to +2% and -19.1 to +3.9% among normal-weight and overweight students, and was balanced across socioeconomic subgroups.

Conclusions:

These findings provide evidence for the effectiveness of school programs in disadvantaged neighborhoods to reduce physical activity inequalities during critical-windows. Investments in health promotion are essential to improve activity, prevent obesity, and may also reduce health inequalities.

O16.3**Effect on physical activity and fitness in a school-based multicomponent intervention among adolescents****Authors:**

Mette Toftager, Lars Breum Christiansen, Peter Lund Kristensen, Pernille Due, Annette K Ersbøll, Eleanor Boyle, Jens Troelsen

Purpose:

School-based interventions have the potential to reduce the age-related decline in adolescents' physical activity (PA). The purpose of this study was to evaluate the effectiveness of a multicomponent environmental school-based intervention, designed to reduce the age-related decline in PA among adolescents.

Methods:

A cluster randomized controlled trial with 2-year follow-up was conducted with 7 intervention and 7 control schools in the Region of Southern Denmark. The evaluation included objectively measured PA and physical fitness, questionnaires and qualitative observations and interviews. The intervention consisted of organizational and physical changes in the school environment with a total of 11 intervention components.

Results:

1348 adolescents (mean age 12.5) enrolled in the study at baseline. At follow-up no significant difference was found for overall PA with an adjusted difference of -19.1 cpm (95%CI:-93,53) or for school time activity 6 cpm (95%CI:-73,85). A sensitivity analysis revealed a significant intervention effect of PA in recess with an adjusted difference of 95 cpm. The small increase in PA during recess was supported by information from questionnaires and qualitative data. The intervention did not have impact on physical fitness across the entire study population, however the most unfit students in the intervention group performed better at follow-up compared to those in the control group. Results varied greatly across schools.

Conclusions:

No evidence was found of an overall effect of a non-curricular multicomponent school-based intervention on PA or physical fitness among Danish adolescents. This could be due to both the design of the intervention programme and the implementation of the intervention components.

O16.4**Intervention for Physical Activity for Youth (IPLAY): Elementary schoolyard environment and recess intervention effects on children's physical activity****Authors:**

Claudio Nigg, James Hill, Raymond C. Browning, Lois Brink, Eve Kutchman, Christine A. Schaefer, Md Mahabub-Ul Anwar, Guangxiang Zhang

Purpose:

We studied the impact of a 2 (renovated vs. non-renovated schoolyards) by 2 (SPARK Active Recreation [AR] curriculum delivered during recess vs. no curriculum) intervention on children's PA during recess and overall leisure time.

Methods:

12 elementary schools with Learning Landscape renovated schoolyards (LLs) and 12 schools with non-renovated schoolyards, (M=486.25 [SD=104.08] students/school; 60% Hispanic. 69% free and reduced lunch) were paired and randomly assigned to curriculum condition in urban Denver, CO. PA during recess was assessed through direct observation (SOPLAY). In a subset (n=8 schools?), self-report surveys (n=1386; 52% female; 59% Hispanic) and accelerometry (n=1475; 49.2% female) determined PA during leisure time and during recess, respectively, over 3 time points (baseline, years 1 and 2).

Results:

SOPLAY results found no significant intervention effects for LLs and SPARK AR, individually or in combination on recess PA outcomes. Survey leisure-time PA data also supported this finding. Accelerometry recess data found children overall spent ~52% of recess time engaged in PA, while the least physically active children spent less than <33% engaged in recess PA.

Conclusions:

Neither the presence of a modified schoolyard environment nor a PA curriculum during recess were sufficient to increase recess PA. Our analyses point to an opportunity to increase recess PA in the least active children and may indicate that recess efforts are not enough of a dose alone to promote children's PA.

Orals 17

Early Life Growth and Feeding

Moderator: Elena Jansen

Affiliation: Institute of Health and Biomedical Innovation, School of Exercise and Nutrition Sciences, Queensland University of Technology, Kelvin Grove, Queensland, Australia

O17.1

The feeding practices and structure questionnaire

Authors:

Elena Jansen, Lynne Daniels, Kimberley Mallan, Jan Nicholson

Purpose:

The principles of responsive and authoritative parenting are increasingly being applied to the feeding context. Responsive feeding encompasses predictable maternal responses to children's signals of hunger and satiety facilitated by routine and structure in feeding. It is postulated to support self-regulation to match intake to need, thereby reducing overfeeding and obesity risk. There are few validated tools to assess maternal responsiveness and structure in the feeding context. Our aim was to construct a questionnaire which measures responsiveness and structure of the meal environment - the Authoritative Feeding Practices Questionnaire (AFPQ).

Methods:

Data were available from 462 mothers and children (age 21-27 months), enrolled in the NOURISH RCT. Items from four established questionnaires and 15 study-specific items were submitted to an a priori item selection, allocation and verification process, before theoretically-derived factors were tested using Confirmatory Factor Analysis.

Results:

Nine factors (40 items) - Structured Meal Setting, Structured Meal Timing, Family Meal Setting, Distrust in Appetite, Reward for Eating, Reward for Behavior, Persuasive Feeding - were confirmed with acceptable model fit and Cronbach's alphas between 0.61-0.89. The latter four factors loaded onto a second-order factor reflecting non-responsive feeding practices.

Conclusions:

While further validity testing is required, the AFPQ provides a unique measure of (non-) responsiveness and structure within the meal environment. The AFPQ extends our conceptualisation of feeding beyond control (pressure, restriction, monitoring). It captures positive rather than negative feeding practices. Interventions that promote positive feeding practices may be less likely to engender maternal guilt and have increased acceptability.

O17.2**Removal of visual and weight cues related to the amount of formula in the bottle as a strategy for preventing overfeeding during bottle-feeding****Authors:**

Alison Ventura, Rebecca Pollack

Purpose:

It is hypothesized that bottle-feeding leads mothers to feed in response to the amount of liquid in the bottle, rather than in response to infant cues, placing bottle-fed infants at higher risk for over-feeding. We tested the hypothesis that providing mothers with opaque, weighted bottles (OWBs; that remove visual and weight cues related to the amount of formula in the bottle) leads to lower infant formula intakes compared to when mothers are given conventional, clear bottles (CCBs).

Methods:

Formula-feeding dyads (n=23) visited our laboratory on two separate days for feeding observations. Mothers were video-recorded while feeding their infants from a CCB on one day and an OWB on the other; bottle-order was counter-balanced across the two days of testing. Both bottles were glass with latex, low flow nipples; the OWB was fitted with a silicone sleeve containing a 60-g metal plate in its base. Infant intake was assessed by weighing each bottle pre- and post-feeding.

Results:

Infants consumed significantly less formula when fed from OWBs compared to CCBs (112.6±8.4ml vs 129.0±9.1ml; $F[1,21]=5.08$, $p=.04$). Mothers were unaware of intake differences, as their reports of how much their infants consumed compared to usual did not differ across test days ($F[1,21]=0.21$, $p=.66$).

Conclusions:

Given the wide-spread usage of bottles for infant feeding, a better understanding of how over-feeding can be avoided is an important focus for obesity prevention efforts. Our study highlights one simple, yet effective intervention: Removal of visual and weight cues related to the amount of formula in the bottle.

O17.3**Effects of intra-uterine growth restriction on self-reported physical activity level in adults****Authors:**

Jessica Redmond, Tom Brutsaert, Qiu Wang

Purpose:

Intra-uterine growth restriction (IUGR) has previously been shown to increase risk of various chronic diseases. The relationship between IUGR (represented by low birth weight) and physical activity levels in adulthood has not been well researched.

Methods:

Respondents to an online survey provided birth outcomes including birth weight (BW) and gestational age (GA). Respondents were asked to compare their physical activity level to their peers, using a 5-point scale (1 = much lower level of activity; 5 = much higher level of activity). Ordinal logistic regression was used to analyze the effect of birth weight and gender on self-reported category of physical activity level. BW was adjusted for GA and categorized into quartiles for analysis.

Results:

948 individuals accessed the survey. 556 (58.6%) respondents provided information on birth outcomes. Of these, 397 (73% female, 20.6 ± 5.6 years) were singleton births to term (37-42 weeks gestation). There was a statistically significant relationship with gender - females were 0.34 times (95% CI, 0.22 to 0.52) as likely as males to self-report the “very high” category compared to all other categories (Wald $X^2 = 25.017$, $p < 0.001$). With increasing birth weight quartile, the odds were 1.23 times higher (95% CI, 1.05 to 1.46) that subjects self-reported the “very high” category of physical activity versus the remaining categories, a statistically significant effect (Wald $X^2 = 6.267$, $p = 0.012$).

Conclusions:

Small BW-for-GA is associated with decreased physical activity levels in adulthood. Thus, prenatal nutrition education is important to reduce risk of IUGR.

017.4**Intrauterine programming of body fat patterns: A path analysis in 4 years-old children from Generation XXI****Authors:**

Susana Santos, Andreia Oliveira, Milton Severo, Ana Cristina Santos, Henrique Barros

Purpose:

To quantify direct and indirect effects of pregnancy-related exposures on body fat patterns at 4 years of age.

Methods:

Singleton children of the Generation XXI birth cohort were considered after evaluation at 4 years ($n=4156$) and multiple data were obtained, namely on body mass index (BMI), waist-to-hip ratio (WHR), waist-to-thigh ratio (WTR), and fat mass index (FMI). These were used to identify body fat patterns by principal component analysis. Several exposures, recorded at birth, and from children's infancy were assessed and those associated with body fat (gestational weight gain, diabetes and smoking) were included in a causal model, and studied using path analysis.

Results:

Two independent patterns of body fat were identified, explaining 88% of total variance: Pattern 1 was more associated with BMI and FMI; Pattern 2 with WHR and WTR. Maternal smoking had a positive direct effect on Pattern 1 (boys: $B=0.200$, 95%CI[0.116;0.284]; girls: $B=0.187$, 95%CI[0.082;0.293]), stronger than the indirect effects through birth weight and gestational weight gain. In both sexes, higher maternal weight gain resulted in higher scores in Pattern 1 but lower scores in Pattern 2; both effects were mainly due to a direct pathway. The effect of gestational diabetes on Pattern 1 was mostly through birth weight in girls ($B=0.019$, 95%CI[0.006;0.032]), whereas no significant association was found in boys.

Conclusions:

Direct effects of pregnancy-related exposures on body fat at age 4-years prevailed over the indirect effects through birth weight. Smoking during pregnancy was the strongest determinant of adiposity. Smoking cessation and avoiding over-nutrition are essential preventive measures.

Orals 18 Technology

Moderator: Elizabeth Dunford

Affiliation: The George Institute for Global Health, Sydney, NSW, Australia

O18.1

FoodSwitch: A smartphone application for front-of-pack nutrition labelling

Authors:

Elizabeth Dunford, Helen Trevena, Chester Goodsell, Tony Ng, Jacqui Webster, Bruce Neal

Purpose:

Front-of-pack nutrition labelling may aid consumers in making healthier food choices. With more and more consumers using smartphone technology to shop for food, we sought to develop an application that would provide consumers with easy-to-understand nutrition information and support the selection of healthier choices when food shopping.

Methods:

An existing branded food database including 17,000 Australian packaged foods underpinned the project. An iterative process of development, review and testing was undertaken to define a user interface that could deliver nutritional information. A parallel process identified the best approach to rank foods based on nutritional content, such that healthier alternative products could be recommended.

Results:

Barcode scanning technology was identified as the optimal mechanism for interaction of the smartphone with the food database; traffic light labels were the preferred format for presenting nutritional information; and the Food Standards Australia New Zealand nutrient profiling method as the strategy for identifying healthier products. The resulting FoodSwitch smartphone application was launched in Australia in January 2012 and was downloaded by ~400,000 users in the first 18 months. Nutritional information for >30,000 additional products has been obtained from users through a crowd-sourcing function integrated within the application.

Conclusions:

FoodSwitch has empowered Australian consumers seeking to make better food choices. In parallel, the huge volume of crowd-sourced data has provided a novel means for low-cost tracking of the nutritional content of Australian foods. There is significant opportunity for this approach in many other countries.

O18.2

“Hidden” social networks in behavior change interventions

Authors:

Ruth F. Hunter, Helen McAneney, Michael Davis, Mark A. Tully, Frank Kee

Purpose:

Many interventions do not account for the interaction among individuals and how such interactions may affect outcome, thereby negating the influence of social networks. The purpose of this study was to explore the unintentional “hidden” networks in a complex physical activity (PA) intervention.

Methods:

Using RFID technology embedded in swipe cards which participants scanned at sensors placed around the environment when undertaking PA, social connections were inferred based on spatio-temporal co-occurrences involving card scans: (1) on the same day; (2) at the same sensor location (at least at 3 or more co-occurrences); and, (3) timestamps within 10 seconds. The social ties were investigated using a range of mathematical network parameters, including network density (proportion of ties in the network) and degree centrality (number of connections a node has).

Results:

Of the 406 participants, 225 engaged in PA involving social connections with at least one other individual, with 5,578 social connections inferred over the 12-week intervention with 282 distinct pairings of participants, demonstrating clear evidence of unintentional “hidden” networks within the behavior change intervention. Illustrations of how the social networks change over the 12-week intervention demonstrate the shortcomings of previous methods of collecting self-report sociometric data.

Conclusions:

Emerging technologies offer a new method to enable unintentional “hidden” networks in behavior change interventions to be objectively observed and measured longitudinally. Further, this data can be analysed in real-time to help inform behavior change interventions and can further our understanding of the role of social networks in behavior change interventions.

O18.3**A meta-analysis of weight management interventions using mobile phone text messaging****Authors:**

George Siopis, Tien Chey, Margaret Allman-Farinelli

Purpose:

Among more recent innovations in health service provision is the use of text messaging to facilitate health behavior change including weight management. This meta-analysis investigated the efficacy of programs incorporating text messaging as a major component in the primary management of overweight and obesity.

Methods:

Medical and scientific databases were searched from January 1993 to October 2013. Eligibility criteria included controlled trials and before and after studies of weight management in children and adults that used text messaging and included a nutrition component with mean body weight change as the primary outcome. The review was conducted according to PRISMA guidelines. Analyses were performed with STATA software version 11 [STATA Corporation, College Station, TX, USA] using analyst defined metan metareg metafunnel and metabias procedures.

Results:

From 512 manuscripts retrieved, six studies met the criteria for inclusion in meta-analysis. All studies were in adults with four randomized controlled trials and two before and after studies. The weighted mean change in body weight in intervention participants was -2.56 kg [95% CI -3.46, -1.65] and in controls -0.37 kg [95% CI -1.22, 0.48] over periods of eight to twelve weeks.

Conclusions:

The small body of evidence indicates text messaging interventions can promote weight loss. However, lack of long-term results indicates further efficacy studies are required.

O18.4**Social support for physical activity on social network sites: A content analysis****Authors:**

Jeroen Stragier, Peter Mechant

Purpose:

Sharing of physical activity related statuses on social network sites (e.g. ‘Just completed a 3.4 mi walk’) is becoming increasingly common. Often, these statuses are posted with an expectation of receiving feedback from online peers. The aim of our research was to determine the nature of this feedback and more specifically, to what extent it contains social support.

Methods:

A deductive qualitative content analysis was performed on 2533 comments (“@-replies”) on 882 physical activity related statuses posted on the social network site Twitter. Cutrona & Suhr ‘s (1992) typology of social support was used as classification framework. The typology distinguishes information support, tangible assistance, network support, esteem support and emotional support.

Results:

43.6% of the comments contained one or more types of social support defined in the typology. Esteem support, expressed as compliments for completion of physical activity was most prevalent and found in 28.9% of the comments. Information support occurred in 9.9%, emotional support in 4.2% and tangible assistance in 0.6% of the comments. 9.6% contained expression of gratitude for social support provided in a preceding comment.

Conclusions:

Social media are used for posting physical activity related tweets. These status updates are often replied to by online peers. As our analysis indicates, this mostly implies endorsing or congratulating the poster for his/her achievements. The expressions of gratitude found in the analysis also indicate significant appreciation for this source of social support. Our methodology could easily be applied to analogous nutrition related status updates as well.

Orals 19

Economics/Neighborhoods Nutrition & PA

Moderator: Calum Mattocks

Affiliation: MRC Epidemiology Unit, University of Cambridge, Cambridge, UK

019.1

Relocation to New Environments (RENEW): A feasibility and pilot study

Authors:

Calum Mattocks, Jenna Panter, Jamie Anderson, Fiona Bull, Felicia Huppert, Andy Jones, Nick Osborne, David Ogilvie

Purpose:

Newly-built residential neighbourhoods represent a ‘living laboratory’ for testing causal hypotheses about the health benefits of redesigning the built environment. The Relocation to New Environments (RENEW) project comprises a feasibility and pilot study designed to inform a future longitudinal study of the impacts of moving to such neighbourhoods on physical activity (PA) and well-being. RENEW has three initial aims: To investigate the feasibility of recruiting participants prior to moving; to compare alternative methods of recruiting controls; and to compare alternative methods of data collection.

Methods:

Participants intending to move into new residential developments in two areas of the UK are recruited via developers and housing associations (gatekeepers).

Results:

Methods for recruiting non-moving controls and collecting data are piloted and compared using a two-stage randomised controlled trial. Stage one compares recruitment of controls via snowball sampling of neighbours of the index participant with recruitment via the electoral register. Stage two compares response rates and data quality from a longer questionnaire with those from a shorter questionnaire coupled with georeferenced PA data from accelerometers and GPS receivers. Qualitative interviews with participants and gatekeepers will examine people’s expectations of moving home and individual and corporate factors important for recruitment.

Conclusions:

The results will improve our understanding of the feasibility and methodological implications of conducting longitudinal studies of the impacts of moving to newly-built residential neighbourhoods on PA and well-being. The rigorous evalua-

tion of such natural experiments is expected to make an important contribution to the evidence linking environmental change with PA behavior change.

O19.2

The impact of area-based initiatives on physical activity trends in deprived areas; a quasi-experimental evaluation of the Dutch District Approach

Authors:

Daniëlle Kramer, Mariël Droomers, Birthe Jongeneel-Grimen, Marleen Wingen, Karien Stronks, Anton Kunst

Purpose:

Numerous area-based initiatives (ABIs) have been implemented in Western Europe to improve the living conditions in deprived areas. There is little robust evidence of their impact on physical activity (PA). This study aimed to assess the short-term impact of a Dutch ABI called the District Approach, on trends in leisure-time PA in deprived target districts.

Methods:

Repeated cross-sectional data on 48401 adults across the Netherlands (of which 1517 residents of deprived target districts) were obtained from the Integrated Survey on Household Living Conditions (POLS) 2004 to 2011. A quasi-experimental interrupted time-series design was used. Multilevel logistic regression analyses were performed to assess pre- and post-intervention trends in leisure-time walking, cycling, and sports (>0 minutes per week). Trends in deprived target districts were compared with trends in various control groups. The role of the intensity of environmental interventions was also assessed.

Results:

Deprived target districts showed a significantly positive pre-post intervention trend change in walking. The trend change in the deprived target districts was significantly larger compared to the rest of the Netherlands, but not compared to other deprived districts. For cycling and sports, neither deprived districts nor control districts showed a significant trend change. For all leisure-time PA outcomes, trend changes were not related to the intensity of environmental interventions in the deprived target districts.

Conclusions:

Some evidence was found to suggest that ABIs like the District Approach have a positive impact on leisure-time PA in deprived districts, regardless of the intensity of environmental interventions.

O19.3

Resilience and hope: Context shaping meaning in experiences of household food insecurity

Authors:

Nicholas Younginer, Christine Younginer, Sonya Jones, Carrie Draper

Purpose:

Household food insecurity is embedded in the context of individual families, and the families are embedded in social, political, and historical contexts that create their experience of food security. The purpose of this study was to better understand contexts in which individuals experience household food insecurity by exploring life trajectories.

Methods:

Fourteen adults, recruited through food pantries and transitional housing, participated in a qualitative in-depth interview. Participants were over 18 years old and had a child living with them at least 50% of the time. Participants described their life as a series of episodes and identified high and low points and times when they struggled with food shortages. Data were analyzed using the constant comparative method. Patterson's Family Adaptation and Adjustment Response Model (FAAR) guided the analysis, and data were coded to identify demands, assets, and concepts of world-view across the participants' life course.

Results:

The interviews revealed themes of food security and were categorized as “persistent food insecurity”, “intermittent food insecurity”, and “recent food insecurity”. Commonly identified assets were family support, job training, housing, and assistance programs. Common demands were identified as injury or illness, unstable partnerships, medical expenses, and job/ assistance program loss. Common concepts of worldview were the role of religion, perceptions of participation in assistance programs, and the importance of family support.

Conclusions:

Our findings provide insight into different life trajectories that include experiences of food insecurity and how participants’ conceptualizations of their assets and demands shapes the salience of their food insecurity experiences.

O19.4**A cash-back rebate program for healthy food purchases in South Africa: Results from scanner and survey data****Authors:**

Roland Sturm, Ruopeng An, Deepak Patel, Josiase Maroba, Darren Segal

Purpose:

Evaluate the effects of 10% or 25% discount program for healthy food purchases in 800 supermarkets.

Methods:

South Africa’s largest health insurer developed a cash-back rebate of up to 25% for healthy food purchases available in 800 supermarkets nationwide. We link scanner data of food purchases to a panel of N=170,000 households (60% eligible for the rebate), using a household fixed-effect model and a case-control differences-in-differences model to control for selection. We also analyze a repeated survey with diet questions fielded on N=360,000 plan members using an instrumental variable method to control for selective program participation. The instrumental variable is the differential distance from home to the nearest participating supermarket relative to the nearest competing supermarket, which should affect program participation but is independent of individual taste preferences.

Results:

Rebates of 10% and 25% for healthy foods are associated with an increase in the ratio of healthy to total food expenditure by 6.0% and 9.3%; an increase in the ratio of fruit and vegetables to total food expenditure by 5.7% and 8.5%; and a decrease in the ratio of less desirable to total food expenditure by 5.6% and 7.2%. Results for the survey data are pending.

Conclusions:

According to scanner data, participation in a rebate program for healthy foods led to increases in purchases of healthy foods and to decreases in purchases of less-desirable foods that seem to match price-elasticity estimates from U.S. time series data.

Orals 20

Sedentary Behaviors in Children and Adults

Moderator: Sarah Robinson

Affiliation: Deakin University, Victoria, Australia

O20.1

Patterns of objectively measured sitting time and associations with cardiovascular risk factors among 7-10 year old children

Authors:

Sarah Robinson, Nicola Ridgers, Robin Daly, Jo Salmon

Purpose:

To describe the association between sitting time, breaks and bouts in sitting time and cardiovascular risk factors among children.

Methods:

A subsample of children participating in the Transform-Us! intervention study (n=214; age, 7-10 years) in Melbourne, Australia wore activPAL™ inclinometers for eight days. Anthropometric data were collected using standardised procedures. Systolic (SBP) and diastolic (DBP) blood pressure were measured using an automatic digital blood pressure machine. Lipoprotein levels were measured from fasted, morning blood samples by a commercial laboratory. Linear regression models, adjusting for school clustering, activPAL stepping time and wear time, diet and waist circumference were used to assess the associations between average daily sitting time, breaks and bouts of sitting time (2-5, 5-10, 10-15 and >15 mins) and cardiovascular risk factors.

Results:

One hundred and eight children (48% boys) had valid measures for all covariates. A higher frequency of sitting breaks and 5-10 minute sitting bouts was inversely associated with SBP after adjusting for stepping time, diet and waist circumference ($p<0.001$ and $p<0.05$ respectively). A higher frequency of 10-15 minute bouts was independently and positively associated with triglycerides ($p<0.05$).

Conclusions:

Irrespective of stepping time, diet and waist circumference the results of the current study suggest breaking up sitting time and shorter bouts of sitting time may be beneficial to SBP. Conversely, longer bouts (10-15 minutes) appear to be adversely associated with triglycerides. Further research is needed to ascertain the threshold at which the length of sitting bouts may be detrimental to cardiovascular health.

O20.2

The differential effects of sustained versus interrupted sitting on glucose metabolism

Authors:

Richard Pulsford, Melvyn Hillsdon, James Blackwell, Brad Metcalf, Katarina Kos

Purpose:

Interrupting prolonged sitting may attenuate its negative effects on glucose metabolism, although it is unclear whether these interruptions must meaningfully increase energy expenditure or whether a change in posture (from sitting to standing) is sufficient.

Methods:

Twenty-five male participants (aged 40.21 ± 12.19 yrs) completed three interventions in a randomised cross-over design. Intervention 1 (SIT-ONLY) featured a 7hr day of sustained sitting. In interventions 2 (SIT-STAND) and 3 (SIT-WALK) 7hrs of sitting was interrupted every 20 minutes with 2 minute bouts of standing, or walking at 3.2 km.hr⁻¹. An oral glucose tolerance test (OGTT) was completed in the morning and a test meal consumed at lunch time. Between trial differenc-

es in Matsuda Insulin Sensitivity Index (M-ISI) and incremental area under the curve (iAUC) for post-OGTT and post-meal glucose and insulin were examined using adjusted general estimating equation models.

Results:

M-ISI (mean \pm SE) was significantly lower in SIT-ONLY (5.62 \pm 0.43) compared to SIT-WALK (6.33 \pm 0.53, $p=0.005$). Post-OGTT iAUCs for glucose and insulin were 27% and 22% higher respectively in SIT-ONLY compared to SIT-WALK ($p=0.001$ for both). Post-meal iAUC for insulin was also 22% higher in SIT-ONLY compared to SIT-WALK ($p=0.001$). M-ISI, post-OGTT and post-meal iAUCs for glucose and insulin did not differ significantly between SIT-ONLY and SIT-STAND interventions.

Conclusions:

Interrupting sitting with light intensity walking significantly benefits glucose metabolism, suggesting that minor behavioral changes could ameliorate some of the adverse health consequences of sustained sitting. Further research is needed to examine whether longer or more frequent bouts of standing could do the same.

O20.3**Correlates of TV and computer time in 10- to 12-year-old children across five European countries: The ENERGY-project****Authors:**

Maïté Verloigne, Wendy Van Lippevelde, Elling Bere, Yannis Manios, Eva Kovacs, Monica Grillenberger, Johannes Brug, Ilse De Bourdeaudhuij

Purpose:

The aim was to investigate which individual and environmental factors are related to TV and computer time in 10- to 12-year-olds across five European countries. We examined possible differences in relating factors according to the sedentary activity and between the five countries.

Methods:

Data were used from the ENERGY intervention-study. Children and one of their parents completed a questionnaire, including questions on sedentary activities and relating factors. Data from 2042 children (53.8% girls, mean age 11.2 \pm 0.8years) were analyzed via multilevel regression analyses.

Results:

No physical environmental factors significantly associated with TV time. Having an own computer was positively significantly associated with computer time (Greek and Hungarian children). Regarding sociocultural environmental variables, parental knowledge was negatively significantly related to both behaviors and parental sedentary behavior (with the child) was positively significantly related to both behaviors. For political environmental variables, having parental rules was negatively significantly related to TV time (Greek children), but not to computer time. Economic environmental factors were not significantly associated with TV/computer time. Regarding individual factors: Children's awareness, knowledge and self-efficacy were negatively significantly related to both behaviors. Children's preferences was positively significantly related to both behaviors. Children's attitude, habit and agreement were only positively significantly related to computer time.

Conclusions:

Most evidence was found for an association between both sedentary activities and sociocultural environmental and individual factors. Future interventions need to focus on both the child and parents, as parents need to be made aware of the importance of reducing sedentary behavior and being a role model.

O20.4

Reducing workplace sitting: Comparison of multi-component versus height-adjustable workstation interventions

Authors:

Maike Neuhaus, Genevieve N Healy, David W Dunstan, Neville Owen, Elizabeth G Eakin

Purpose:

High volumes of sitting time pose a health risk, with desk-based office employees sitting for most of their working day. Height-adjustable workstations may be a key component of interventions to reduce sitting time in office workers. However, their investigation in the context of best-practice approaches, which also include organizational and individual components, is limited. This study compared the efficacy of a multi-component intervention (including organizational and individual behavior change strategies and height-adjustable workstations) to reduce workplace sitting time, to a height-adjustable workstations-only intervention, and a control group.

Methods:

Three-arm quasi-randomized controlled trial involving desk-based office workers of three separate administrative units of a university (multi-component intervention, n=16; workstations-only, n=14; control, n=14). Workplace sitting time was assessed objectively via activPAL3 devices. Data were collected at baseline, 3 months (end-of-intervention), and 12 months between January 2012 and February 2013, and analyzed using linear regression models.

Results:

At baseline, the mean proportion of workplace sitting time was approximately 77% across all groups. Following intervention and relative to the control group, workplace sitting time in the multi-component group was reduced by 89 mins/8-hour workday at 3 months (95% CI= -130, -47 mins; $p<0.001$) and by 33 mins in the workstations-only group (95% CI= -74, 7 mins, $p=0.285$). At 12 months, these changes were maintained.

Conclusions:

The multi-component intervention resulted in a near three-fold improvement in reducing workplace sitting compared to installation of workstations only. These findings provide support for the additional investment in organizational and individual-level intervention elements to reduce sitting time.

Orals 21

Interventions Adults - Weight loss & PA

Moderator: Hannah Littlecott

Affiliation: Cardiff University, Cardiff, UK

O21.1

Psychosocial mediators of change in physical activity in the Welsh National Exercise Referral Scheme: Secondary analysis of a randomised controlled trial

Authors:

Hannah Littlecott, Graham Moore, Laurence Moore, Simon Murphy

Purpose:

While Exercise Referral Schemes (ERS) involving health professional referral to a community exercise facility are increasingly common in the UK, limited attention has been paid to the mechanisms through which they promote behavioral change. This study examines whether effects of the Welsh National ERS (NERS) on physical activity were mediated by autonomous motivation, self-efficacy and social support.

Methods:

A pragmatic randomised controlled trial in 12 Local Health Boards in Wales. Participants (N=2160) with coronary heart disease risk factors or depression/anxiety were randomised to receive a series of one to one consultations and a 16-

week programme of supervised, group-based physical activity (intervention) or a physical activity leaflet only (control). Validated questionnaire measures of psychosocial processes were collected at 6-month follow-up. Physical activity was assessed at 12 months using 7-day Physical Activity Recall telephone interviews. Regression models tested effects on psychosocial processes, and mediation of effects on physical activity.

Results:

Significant effects were found for autonomous motivation ($B=0.32$; 95% CI=0.21 to 0.44) and social support from friends ($OR=1.37$; 95% CI=1.09-1.73) and family ($OR=1.45$; 95% CI=1.15-1.82). Analyses indicated partial mediation of effects on physical activity by autonomous motivation, with the odds ratio falling from 1.39 (1.06 to 1.83) to 1.27 (0.96 to 1.67) after entry of autonomous motivation.

Conclusions:

This study offered key insights into psychosocial processes of change in an ERS. Further research is required to explain socio-demographic patterning, with changes in motivation occurring among all sub-groups, though not always leading to adherence or behavioral change.

O21.2

Physical activity and health-related quality of life: Findings from the Walk 2.0 Study

Authors:

Gregory S Kolt, Mitch J Duncan, Corneel Vandelanotte, Cristina M Caperchione, Richard R Rosenkranz, Anthony J Maeder, Trevor N Savage, Rhys Tague

Purpose:

Web 2.0 Internet-based, interactive applications allow users to control the generation and sharing of information for collaboration. The Walk 2.0 Study is investigating the potential of such applications in a 3-arm randomised controlled trial to better understand how these applications may influence health promotion variables including physical activity (PA) and health-related quality of life (HRQL). This study, in particular, reports on the relationship between HRQL and PA in participants recruited for the trial.

Methods:

The relationship between PA and HRQL was examined using Walk 2.0 Study baseline data ($N=506$ adults; 176 males, 330 females, mean age= 50.8 ± 13.0 years). At recruitment screening, participants reported less than 150 minutes of PA per week. Participants' PA and HRQL were assessed with the Active Australia Survey and Short Form Health Survey (SF-36), respectively. Independent samples t-tests were used to identify differences in PA between participants reporting a more favourable health state (higher SF-36 scores) and those with a poorer health state.

Results:

There were significant differences in PA between participants with higher and lower SF-36 scores for emotional well-being (301.8 ± 341.9 mins vs 228.6 ± 275.5 mins, $t=2.44$, $p<0.05$), energy/fatigue (317.3 ± 352.2 mins vs 208.4 ± 250.5 mins, $t=3.85$, $p<0.001$), and general health (299.7 ± 330.4 mins vs 223.8 ± 277.8 mins, $t=2.68$, $p<0.05$), but no significant difference in physical functioning. Other SF-36 scales were not analysed because of moderate to strong ceiling effects.

Conclusions:

Those with lower PA are likely to report lower HRQL. As such, interventions should consider this relationship and aim to engage participants in a way that enhances HRQL.

O21.3

Weight Loss Maintenance in Adults: The WILMA trial

Authors:

Sharon Simpson, Rachel McNamara, Chris Shaw, Mark Kelly, Liz Randell, David Cohen, Kerry Hood, Andy Hill

Purpose:

Weight loss maintenance interventions have had limited effectiveness with weight regain common. The purpose of this study was to assess a theory based 12-month individually tailored intervention based on Motivational Interviewing (MI) and self-monitoring.

Methods:

The study was a 3-arm RCT comprising 2 intervention arms which differed in amount of MI only, and a control. Individuals were followed up at 6 and 12 months. 170 obese adults aged 18-70 who had lost at least 5% body weight during the previous year were recruited. The primary outcome is BMI at 1 year. Secondary outcomes include waist circumference; waist to hip ratio; physical activity; proportion maintaining weight loss; diet; quality of life; health service resource usage; binge eating, well being and duration of participation and drop out from intervention.

Results:

Baseline characteristics were broadly similar between groups. Mean BMI was 34 in the control group and 35 in the intervention groups. Over 80% in all groups were weighing themselves at least once weekly. Participants indicated fairly high degrees of motivation and confidence regarding maintaining their weight. 82% in the intensive MI group attended all face to face sessions and 89% in the less intensive arm. Follow-up rates at 12 months were 90%.

Conclusions:

This is the first trial of motivational interviewing in a community based sample of individuals who have lost weight. The study data are currently being analysed and results are embargoed by the funder until report submission in February 2014, but will be available for the conference.

O21.4

Can professional football clubs help men achieve sustained improvements in weight, physical activity and dietary outcomes? The results of a randomised controlled trial

Authors:

Sally Wyke, on behalf of the FFIT team

Purpose:

Football Fans in Training (FFIT) is a gender-sensitised, weight management, physical activity (PA) and healthy eating programme designed for delivery to groups of overweight/obese men by community coaches at top professional football clubs in Scotland. A 12-week initial weight loss phase at club stadia is followed by 9 months of light touch, weight maintenance support. We evaluated the effectiveness of FFIT in achieving lasting weight loss, PA and dietary change.

Methods:

A two-arm, pragmatic randomised controlled trial in 13 professional football clubs. Men, aged 35-65, with BMI ≥ 28 kg/m², were randomly assigned to the intervention (undertook FFIT immediately) or comparison (undertook FFIT 12 months later) group, and followed up at 12 weeks and 12 months. Primary outcome was mean difference in weight loss between groups at 12 months. Secondary outcomes included changes in self-reported PA and diet. Intention-to-treat analyses were conducted.

Results:

333/374 men in the intervention group (89%) and 355/373 men in the comparison group (95%) completed 12-month assessments. Those in the intervention group lost significantly more weight than those in the comparison group, and more achieved a clinically-significant ($\geq 5\%$) weight loss at 12 weeks and 12 months. Improvements in PA and diet were also significantly greater in the intervention group.

Conclusions:

The professional football club setting succeeded in engaging men in weight management, and FFIT helped them achieve sustained improvements in weight, PA and diet.

Orals 22

Physical Environment and PA

Moderator: Tom Stewart

Affiliation: Auckland University of Technology, Auckland, New Zealand

O22.1

A novel assessment of adolescent mobility: A pilot study

Authors:

Tom Stewart, Scott Duncan, Basile Chaix, Yan Kestens, Jasper Schipperijn, Grant Schofield

Purpose:

The accurate measurement of daily mobility and travel to non-residential destinations has been identified as an important but almost systematically overlooked factor when investigating the relationship between exposure to the built environment and physical activity. The development of VERITAS - a web-based application nested within a computer-assisted personal interview - allows researchers to assess daily mobility and perceived spaces using interactive mapping technology. This study aimed to demonstrate the feasibility and functionality of using VERITAS with adolescents, and compare urban form and geometric characteristics of the VERITAS-reported neighbourhood with traditional neighbourhood delimitations.

Methods:

Twenty-eight adolescent participants underwent anthropometric assessment before completing VERITAS. Regularly visited destinations, transportation modes, travel companions, and perceived neighbourhood boundaries were assessed. Street network distances between the home and each geolocated destination were generated. Urban form variables and geometric characteristics were compared between the VERITAS-reported neighbourhood, meshblocks, 1 mile Euclidean buffers, and 1 km network buffers.

Results:

529 destinations were geolocated, 58% of which were outside the perceived neighbourhood boundary. Active travel was inversely associated with distance to destinations ($r = -.43$, $p < .05$) and traveling with adults ($r = -.68$, $p < .01$). Urban form and geometric characteristics of the VERITAS-reported neighbourhood were different from those in other neighbourhood delimitations.

Conclusions:

This study demonstrates the feasibility of using VERITAS to assess mobility within adolescent populations, illustrates the potential novelty and use of user defined spaces, and highlights the limitations of relying on restricted definitions of place (i.e., administrative or residential-focused neighbourhoods) when assessing environmental exposure.

O22.2

Objectively measured time in greenspace and salivary cortisol levels in adolescents

Authors:

Ashley Cooper, Ben Wheeler, Tom Griffin, Angie Page

Purpose:

Greenspace has been associated with a range of health benefits including stress reduction, but the evidence is predominantly based upon self-report measures, with few studies using objective measures of time spent in greenspace or of stress. The objective of this study was to investigate whether the time adolescents spend outdoors in greenspace, objectively measured using GPS receivers, is associated with salivary cortisol levels.

Methods:

Participants were 264 adolescents (41% males), mean age 14.6 ± 0.6 yrs, recruited from the PEACH (Personal and Environmental Associations with Children's Health (n=148)) and PEAR (Physical Environment and Activity Relationships (n=116)) studies. Location was recorded every 10 seconds by personal GPS receivers and mapped in a Geographical Information System. Each GPS data point was coded as "in greenspace" or "not in greenspace". Salivary cortisol was measured on one weekday on waking and 30 minutes later, and the cortisol awakening response (CAR) calculated. Linear regression was used to investigate whether time in greenspace predicted the CAR after adjustment for potential confounders (age, gender, deprivation, BMI, physical activity).

Results:

Participants spent 111.6 ± 52.8 minutes ($27.7 \pm 11.0\%$ of recorded time) outdoors on weekdays, with $6.3 \pm 8.2\%$ of time spent in greenspace. No association was found between time in greenspace and the CAR (beta = -0.009 nmol/l, 95% CI $-0.125, 0.108$; $p=0.886$).

Conclusions:

Although studies in adults have suggested that natural environments might be associated with lower salivary cortisol levels, our preliminary findings suggest that this may not be the case in youth.

022.3**Association between school environment and youth's participation in organized, non-organized, individual and group-based physical activities****Authors:**

Stephanie Ward, Mathieu Bélanger, Denise Donovan, Julie Goguen Carpenter, Alain Vanasse

Purpose:

Environmental characteristics at the school level could be associated with youth participation in different types of physical activities (PA). The purpose of this study was to identify which school environmental characteristics were associated with students' participation in organized, non-organized, individual and group-based PA.

Methods:

This cross-sectional analysis included 776 Grade 5 and 6 students from 16 schools in New Brunswick, Canada. School representatives completed questionnaires assessing school environment. Types of PA and attainment of PA recommendations were obtained using self-administered student questionnaires. Associations between environment and student PA were examined using multilevel logistic regressions.

Results:

More boys and girls participated in non-organized (80.2% and 77.8%) and individual PA (75.6% and 80.4%) than organized (44.5% and 44.6%) and group-based PA (60.3% and 53.7%). Achievement of PA recommendations was reported by 13.5% of boys and 9.3% of girls. Schools with favorable active commuting environments were positively associated with girls' participation in organized (OR=1.34, 95% CI=1.04, 1.74) and group-based PA (OR=1.54, 95% CI=1.19, 1.99) and with boys' odds of participating in individual activities (OR=1.45, 95% CI=1.04, 2.04). There was also a positive relationship between having a school environment favourable to active commuting and boys' odds of meeting PA recommendations (OR=2.19, 95% CI=1.43, 3.37). School policies supporting PA were positively associated with girls' odds of participating in non-organized activities (OR=1.18, 95% CI=1.00, 1.40).

Conclusions:

School environments which favor active commuting may encourage participation in different types of PA. School policies promoting PA may also encourage girls to participate in organized activities.

O22.4

Adolescent use of the built environment for physical activity

Authors:

Nicolas Oreskovic, Alyssa Robinson, Joseph Locascio, James Perrin, Minghua Chen, Elizabeth Goodman

Purpose:

Physical activity (PA) occurs in bouts and is, therefore, autocorrelated. Prior pediatric PA studies have used 5 minute epochs, though scant empirical research supports this bout length. Little is known about the relationship between time effects and adolescent use of the built environment (BE) for PA. We sought to determine adolescent PA by comparing different BE use patterns, controlling for time effects.

Methods:

Eighty adolescents around Boston aged 11-14 wore a GPS and accelerometer for 2 weeks. Location (GPS) and PA (counts/minute) data were mapped using GIS with BE use categorized as: Home; school; parks; playgrounds; streets & sidewalks; and other. Autocorrelation between consecutive PA values over time was addressed using time-series analysis, after controlling for other potential factors accounting for autocorrelated PA, including subject, weather and location. Longitudinal mixed effects modeling tested for associations between BE category and PA adjusting for age, sex, race, BMI, weather, and time effects as well as clustering by subject, day, school, and town.

Results:

Subjects were 44% male and 40% white. PA was autocorrelated over time in 15 minute sequences ($p=0.03$). All BE categories independently predicted higher PA compared to home in adjusted analyses ($p<0.0001$ for all). Outdoor PA levels were consistently higher than PA in indoor spaces. Playgrounds yielded the highest increase in PA level ($\beta=176$, $SD=4$) and schools the lowest ($\beta=42$, $SD=2$) compared to home.

Conclusions:

Adolescent use of the BE for PA occurred in 15 minute bouts, well above currently used epoch lengths. Accounting for autocorrelated PA, adolescent PA was higher in outdoor than indoor spaces.

O22.5

Perceived safety from traffic and cycling: Improved predictive validity through anchoring vignettes

Authors:

Klaus Gebel, Jorge Araña, Ding Ding, Chris Rissel

Purpose:

Likert scales are frequently used in public health research, but are subject to scale perception bias. To adjust for different interpretations of a scale for safety from traffic we used anchoring vignettes (hypothetical scenarios that allow calibrating responses), a survey technique mostly used in sociology and economics.

Methods:

Baseline data were used from a study on environments and cycling in Sydney, Australia ($n=870$). Participants aged 18-55 (37 ± 11.1) assessed the safety from traffic for three hypothetical scenarios (vignettes) as anchors for their perceived safety. Associations between traffic safety (both uncorrected and corrected scale scores) and cycling outcomes were examined using partial correlation adjusted for socio-demographic and health covariates. Magnitudes of association with uncorrected and corrected scale scores were compared using a Wald's test. We hypothesized a stronger association of cycling outcomes with traffic safety scores adjusted for scale perception bias compared to the unadjusted scores.

Results:

Nearly all participants successfully rank ordered the vignettes, however, there was significant scale perception bias, indicating the feasibility and importance of using anchoring vignettes. The predictive validity for reported frequency of cycling for any purpose improved by 26% ($p=0.001$) and for cycling as the main mode of transport to work or study by

28% ($p=0.002$) (minutes per week of cycling based on validated travel diaries and GPS measures will also be presented).

Conclusions:

Adjusting for scale perception bias significantly improved the measurement of perceived traffic safety. Anchoring vignettes might be a powerful tool for improving the validity of Likert-scale items in public health research.

O22.6

Is physical activity in manual occupations enough for good health? An ecological analysis

Authors:

Lara Dugas, Pascal Bovet, Terrence Forrester, Estelle Lambert, Jacob Plange-Rhule, Soren Brage, Ulf Ekelund, Amy Luke

Purpose:

The World Health Organization physical activity (PA) guidelines suggest that individuals accumulate 150 min/wk of PA to prevent NCD's. In countries where high proportions of the population engage in manual occupations, many already meet these guidelines, without significant health benefits. The aim of this study was to investigate the impact of manual occupations on objective PA and obesity risk in countries spanning the epidemiologic transition.

Methods:

Samples were drawn from the spectrum of the Human Development Index (HDI), with US & Seychelles (SEY) being high, Jamaica (JA) middle and South Africa (RSA) and Ghana (GH), low. Measurements of objective PA, SES, anthropometrics and body composition, were completed on 2,500 men and women, aged 25-45 years.

Results:

Among men, obesity was lowest in low HDI countries, GH (1.7%) and SA (4.8%) and highest in the US (41%). RSA (55%) and US (65%) women had the highest levels of obesity, compared to only 16% in GH. More men and women in low HDI engaged in manual occupations, reflecting an almost doubling of MPVA among men in GH (45 min/d) and RSA (47 min/d) compared to only 28 min/d in the US. Women in GH (25 min/d), RSA (21 min/d), JA (20 min/d) and SEY (20 min/d) accumulated significantly more MPVA than women in the US (14 min/d), in spite of similar BMI's.

Conclusions:

While there are some significant PA and obesity associations, this relationship is inconsistent across the epidemiologic transition; suggesting that PA policy recommendations should be tailored for each environment.

Orals 23

PA & Nutrition in Young Children

Moderator: Kirsten Davison

Affiliation: Harvard School of Public Health, Boston, MA, USA

O23.1

Anything to make her smile: A conceptual framework for parenting practices around child snacking among low-income caregivers of preschoolers

Authors:

Kirsten Davison, Christine Blake, Rachel Blaine, Nicholas Younginer, Alexandria Orloski, Claudia Gehre, Yasmeen Bruton, Jennifer Orlet Fisher

Purpose:

This qualitative research described parents' practices around child snacking in low-income families to develop a conceptual model.

Methods:

In-depth interviews were conducted with 46 low-income White, African-American, and Hispanic caregivers (95% mothers) of children 3-5 years. Using a semi-structured interview guide, parents were asked about parenting practices around child snacking. Interviews were transcribed and double coded in NVivo10 software using the constant comparative method.

Results:

Caregivers described practices reflecting four overarching parenting dimensions including coercive control, structure, autonomy support, and permissiveness. Coercive practices included excessive limits, using snacks to distract/occupy a child, a lack of responsiveness to child hunger, and using snacks to manage behavior (e.g., she has to earn it). Structure-related practices included making healthy snacks available and accessible, limiting the availability of unhealthy snacks, portioning snacks, establishing snacking routines, and moderate limit setting (e.g., when that's gone that's it, we ain't at the buffet). Autonomy supportive practices included the provision of snacking choices, using snacks to build independence/knowledge, and responsiveness to child hunger. Permissive feeding practices, the most frequently reported category, included the absence of snacking limits (e.g., I just can't say no), making snacking decisions based on social (e.g., go on just let him have it) and physical cues and child demands, and using snacks to express love/make the child happy.

Conclusions:

Feeding practices around snacking fit into a conceptual framework that builds on previous parenting theory and child feeding research. Findings will be used to develop an empirically-based measure of parenting practices around child snacking.

023.2**Obesity of Portuguese preschool children and associations with family characteristics and child behaviors****Authors:**

Cristina Padez, Augusta Gama, Isabel Mourão, Nogueira Helena, Rosado Marques Vitor

Purpose:

The prevalence of obesity among children has steeply increased over the past several decades. Portuguese children followed this trend.

Methods:

A cross-sectional study was done in a sample of 9847 children, aged 3.0-7.0 y. Weight and height were measured, and parents filled out a questionnaire about family such as parental educational level and parental obesity and child characteristics. Overweight and obesity, using cut-off points as defined by the IOTF, were used. Data was analyzed using the chi-square test and the multivariate logistic regression analysis adjusted for age and sex.

Results:

The prevalence of obesity (including overweight) in boys was 21.3% and in girls was 28.3%. The prevalence of obesity increased by time of TV viewing: < 2h, 22.0% and ≥ 2 h, 25.7%; decreased by active play < 2 h, 23.6% and ≥ 2 h, 28.6%; increased with breakfast skipping, yes 24.4% and no, 32.9%, increased with father obesity - father overweight, 26.9 and father obesity, 36.3% - and mother obesity, mother overweight, 31.1% and mother obesity, 38.2%; decreased with father educational level, 4 years, 29.0%, 6 y, 27.9%, 9y, 25.7%, 12y, 24.8% and > 12 years, 19.7% as well as mother educational level, 6 y, 30.1%, 6 y, 28.7%, 9y 26.2% 12y, 24.4% and > 12 y, 21.6%. The logistic regression analysis showed significant associations with children obesity and all the other factors.

Conclusions:

We conclude that Portuguese schoolchildren showed a highest percentage of obesity and sedentary behaviors as well as parental characteristics are significantly associated with children obesity values.

O23.3

A modified coding system for child and parent mealtime behaviors in early childhood

Authors:

Kelly Lowry, John Lavigne, Holly Skeens, Dray DeCator

Purpose:

To examine the feasibility of a modified coding system to evaluate parent and child mealtime behaviors in early childhood.

Methods:

Parent-child dyads of 2- to 3-year-old children participated in a home-based assessment and completed the Child Feeding Questionnaire, the Children's Eating Behavior Questionnaire, subscales of the Home Observation Scale, Food Frequency Questionnaires, and a videotaped and coded mealtime interaction. A modified version of Klesges' Bob and Tom's Method of Assessing Nutrition (BATMAN) was used to categorize observable parent and child mealtime behaviors.

Results:

105 racially, ethnically, and weight-diverse (59% minority) families participated in the project. Mealtime data was available for 99 families (6 families excluded due to poor video quality). Child behaviors of interest included frequency of; bites, drinks, requests for food, declination of food, crying, spitting out food, and acceptance of parental food offers. Parent behaviors of interest included frequency of; bites, drinks, physical encouragement to eat, physical discouragement to eat, verbal encouragement to eat, verbal discouragement to eat, presentation of food, offering of food, eating-related praise, instruction to slow down eating, and instruction to hurry up eating. Antecedent and consequent behaviors in parent-child interactions were also examined as each behavior was coded in actual time (vs an interval time system). Qualitative ratings of parental supportive presence, respect for child autonomy, hostility, and expressed negative and positive affect were assessed.

Conclusions:

A modified version of the BATMAN coding system has high potential for use in examining the impact of parent-child behaviors and interactions on outcomes in early childhood.

O23.4

The home environment and toddler physical activity: An Ecological Momentary Assessment (EMA) study

Authors:

Erin Hager, Nicolas Tilton, Raquel Arbaiza, Kristen Hurley, Maureen Black

Purpose:

To determine social/physical factors in the home environment associated with toddler physical activity (PA) using EMA (real-time data collection).

Methods:

Low-income mother-toddler dyads (n=277) were recruited. Mothers received handheld PDA (Palm Z22) to collect EMA data (53 random beeps over 8 days). A brief social/physical environment questionnaire followed each beep. Simultaneously, toddlers wore an Actical accelerometer (Respironics, Inc.) on their left ankle to assess PA. Data recorded 15 minutes before/after survey response time were extracted/summarized as average activity counts/minute. Linear mixed-effects models (accounting for within-subject clustering) were used with PA as outcome, adjusting for toddler age, gender, urban/suburban residence; moderating effects of covariates were examined. Hypothesized associations include: Outside, other children nearby, mother-child interaction, TV off.

Results:

60% of sample (n=164) had both EMA and PA data (mean age 20 months, range:12-31, 55% male, 66% black, 54% urban). 3592 EMA responses were recorded, with toddler present for 71%. Outdoor location was moderated by age, with an additional 68 counts/minute for each successive 3-month age group over 15 months compared to indoor location (p<0.01,

95% CI:24-112). Having other children present accounted for 272 additional counts/minute ($p<0.0001$, CI:181-364) and mother-child interaction was associated with 343 additional counts/minute ($p<0.0001$, CI:298-388) compared to alternatives. No association found between television and PA.

Conclusions:

Factors in home environment were associated with toddler PA, including outside location, having other children nearby, and mother-child interaction. EMA is a novel method, allowing researchers to capture contextual factors associated with health behaviors in natural environments.

O23.5

Studying Physical Activity in preschool Children and their Environment (SPACE): The influence of childcare attendance on preschoolers' activity behavior

Authors:

Kathryn R. Hesketh, Esther E.M. van Sluijs

Purpose:

To determine the influence of childcare attendance and daily time spent in care on physical activity (PA) levels of a childcare-based sample of 3-4-year-old children.

Methods:

A cross-sectional observational study in 30 preschools in Cambridgeshire, UK. PA levels of 201 children (51% female) were measured using accelerometry for <7 days (mean 6.7 ± 1.1). The association between parental reported childcare attendance and three outcome variables: Average minutes per hour spent sedentary, in light PA (LPA) and in moderate-to-vigorous PA (MVPA) were assessed using three-level mixed-effects linear regression analyses. The influence of childcare attendance at different times throughout the day was also explored.

Results:

Children engaged in approximately 571.0 ± 67.5 minutes of activity on average each day. Children were less sedentary and more active when in care compared to at home, and this association differed by sex (in vs. out of care: sedentary: boys: -6.3 (95%CI: -7.4,-5.3) minutes per hour; girls: -4.7 (-5.8,-3.6); LPA: girls: 1.7 (0.9,2.5); MVPA: boys: 5.8 (4.7,6.9); girls: 3.0 (1.9,4.0)). Observed differences were largest in the mornings (7am-12pm), and early evenings for boys (5-7pm). Overall, compared with non-care days, days in care were significantly less sedentary (boys: -3.8 (-5.2,-2.3); girls: -2.7 (-4.1,-1.2)) and more active (MVPA: boys: 4.3 (2.6,6.1); girls: 2.5 (1.0,4.1)).

Conclusions:

Despite wide-spread concerns about preschoolers' low activity levels in childcare, childcare attendance was positively associated with children's PA here. Future research should assess what factors drive this differential effect of location. Interventions may consider targeting non-care time to achieve maximum gains in preschoolers' PA.

O23.6

Childcare use associated with more frequent intake of healthy foods than being cared for at home

Authors:

Reetta Lehto, Päivi Mäki, Carola Ray, Tiina Laatikainen, Eva Roos

Purpose:

As some forms of childcare have been found associated with overweight in children, especially in North America, food intake has been suggested to explain this association. Still, few studies have compared the diet of children in childcare and not in childcare.

Methods:

The cross-sectional data consists of 1684 3- and 5-year-old children participating in the Child Health Monitoring Devel-

opment project study (LATE-project), conducted in 2007-2009 in Finland. Parents completed a questionnaire including questions on childcare use and a 26-item FFQ on former day's food intake. Based on the FFQ, two food indices were formed: Healthy food index including vegetables, fruit, whole grain bread, skim milk, and margarine and sweets index including cocoa, sweets, desserts, puddings, sugar-containing soft drinks, and squash. Current form of childcare was defined as childcare center, family-based daycare, and home (including parental and non-parental care).

Results:

Being cared for at childcare, and especially meals eaten at childcare the former day were associated with more frequent intake of healthy foods compared with being cared for at home. Amount of meals eaten at childcare the former day were also associated with less frequent intake of sweet foods and beverages.

Conclusions:

In Finland food intake of children who are being cared for at childcare outside home seems healthier than food intake of children at home. Our results also confirm previous results from Finland. Food is provided free of charge at childcare centers to all. Results reflect the healthiness of foods provided at childcare centers in Finland.

023.7

Association between home food availability and food in sack lunches for Texas preschool children varies between healthy and unhealthy foods

Authors:

Naomi Chen, Nalini Ranjit, Courtney Byrd-Williams, Cindy Roberts-Gray, Margaret Briley, Maria Romo, Shreela Sharma, Deanna Hoelscher

Purpose:

To explore the association between home food availability and parent-packed sack lunches for preschool children; few studies have analyzed this association.

Methods:

Baseline data from the Lunch is in the Bag intervention were used. Parents (n=575) whose preschoolers (3-5 years) brought lunch to their Early Care and Education Centers (ECEC) self-reported foods in their home using a validated checklist (Home Food Inventory). Servings of vegetables, fruit, whole grains, sweets, and chips in lunches were directly observed at ECEC's. The association between availability and servings packed was examined using multi-level regression with nesting within classrooms and ECEC's, controlling for demographic variables and BMI.

Results:

Parents reported high home availability of vegetables (mean \pm SD: 12.8 \pm 3.8), fruits (13.0 \pm 4.4), whole grains (3.6 \pm 1.6), sweets (3.5 \pm 2.3) and chips (4.7 \pm 2.2). Children's sack lunches had few servings of vegetables (0.5 \pm 0.5) and whole grains (0.5 \pm 0.5), but more servings of fruit (0.9 \pm 0.2), sweets (1.4 \pm 1.4), and chips (0.4 \pm 0.7). Few lunches (23%) contained vegetables and fruit and whole grain, while most (87%) contained either sweets and/or chips. Availability was positively associated with servings packed for fruit, sweets, and chips (b: 0.03-0.10; p: <0.001-0.003), but not associated for vegetables and whole grains.

Conclusions:

Despite substantial vegetable and whole grain availability in the home, parents packed few vegetables and whole grains. Yet, availability of sweets and chips was positively associated with sweets and/or chips servings packed. Interventions targeting lunch-packing behaviors should address healthy and unhealthy foods separately, and provide strategies to incorporate healthy foods in the home into sack lunches.

Orals 24

Nutrition & PA in Minorities

Moderator: Meg Bruening

Affiliation: Arizona State University, Phoenix, AZ, USA

O24.1

A tale of two breakfasts: Prevalence and correlates

Authors:

Meg Bruening, Kevin Afuso, Maureen Mason

Purpose:

To examine the prevalence and correlates of consuming two breakfasts among low-income preschool students in Phoenix, Arizona.

Methods:

A cross-sectional study exploring the prevalence and potential factors related to the consumption of two breakfasts was conducted in 2013. Low-income parents (n=272; 86.5% Hispanic; 61% non-English speaking) from 24 Head Start sites in Phoenix completed paper (English or Spanish) surveys that addressed their child's breakfast consumption patterns, parents' perceptions of the quality or quantity breakfast at Head Start, parental breakfast habits and household food insecurity status. Survey data were linked to child/household sociodemographics and height/weight collected by Head Start. Logistic regressions, adjusted for household education, income, and race/ethnicity examined associations with the above measures and two breakfasts.

Results:

The prevalence of consuming two breakfasts on the day of data collection was 26% and 33% reported that their child eats two breakfasts 3 or more days per week. Reports of two breakfasts was significantly associated with a 50% lower odds of overweight obesity ($p=0.040$), higher odds of waking up earlier ($OR=1.9$; $p=0.031$) and higher parental education ($p=0.040$). Consuming two breakfasts was not associated with parental breakfast habits, perceptions of the quality or quantity of breakfast at Head Start, household food security status, or other sociodemographics.

Conclusions:

Among this sample, children who consumed two breakfasts did not have higher rates of overweight/obesity; in fact, two breakfasts was protective against overweight/obesity. More research is needed on how consuming breakfast impacts consumption throughout the day and the prevalence and correlates of two breakfasts in other age groups.

O24.2

Factor analysis of a modified parenting strategies for eating and physical activity questionnaire in Latino children

Authors:

Sandra Soto, Elva Arredondo, Lucy Horton, David Strong, Guadalupe Ayala

Purpose:

Research shows that Latino parenting practices influence children's dietary and weight outcomes. However, studies are needed to examine child-reported parenting practices. The Parenting Strategies for Eating and Activity Scale (PEAS) has been validated in adults but not in children. The current study evaluates the factor structure and reliability of a modified version of the PEAS in Latino children.

Methods:

Baseline data were collected from 361 children ages 7-14 from Imperial County, California, enrolled in a randomized controlled trial to promote healthy eating. The PEAS was modified following formative research: Physical activity items were removed leaving 16 candidate items covering five subdomains (Limit-setting, Monitoring, Disciplining, Controlling, Reinforcing) with new items added to Limit-setting and Disciplining, three new items added to Reinforcing, and four new items added to capture a sixth subdomain, Permissiveness.

Results:

Children were ten years old ($SD = 2$), 50% girls, 93% Latino, 81% US-born, and 55% preferred English-language surveys (vs. Spanish). Using oblique rotation, 11 items were removed due to cross-loading, factor loadings below .45, or low ($<.20$) communalities. Parallel analysis and interpretability suggested a three-factor solution explaining 58% of the variance. Factors were relabeled as: Monitoring, Rule-Setting, and Pressuring, consisting of six, five, and three items and Cronbach's alphas of .83, .72, and .67, respectively.

Conclusions:

The modified PEAS demonstrated fewer and different factors in children than those previously validated in adults, indicating the need for refined instrumentation to assess child-reported parenting practices. Additional research is needed to further develop and validate the PEAS for child report.

O24.3**Gender differences in the association of food insecurity and BMI among a U.S. Latino population****Authors:**

Stephenie Lemon, Monica Wang, Dean Cleghorn, Jeffrey Geller, Tariana Little, Lauren Powell, Milagros Rosal

Purpose:

This study examined gender differences in the association of food insecurity with body mass index (BMI) among a U.S. Latino sample.

Methods:

Baseline data from a longitudinal study of Latino adults in Massachusetts were used. Participants were patients at a community health center randomly sampled from ambulatory clinic records. Food insecurity was assessed by the USDA Food Security Survey short-form, with individuals categorized as food secure (score <2), low food insecurity (2-4) and high food insecurity (5-6). Measured height and weight was used to calculate BMI. Covariates included age, gender, education, perceived income and perceived stress. Multivariate linear regression models examined associations between food insecurity and BMI by gender.

Results:

Participants ($n=602$) were 51% female with a mean age of 46 years and 53% having less than a high school education. The majority were born outside of the U.S. (70% Dominican Republic, 14% Puerto Rico). 47% of women and 35% of men were obese. The overall food insecurity prevalence was 44.5% among women and 40.1% among men, with 17% of both genders having high food insecurity. Among women, both high ($\beta=3.05$ ($SE=1.05$), $p=.004$) and low ($\beta=2.41$ ($SE=.83$), $p=.004$) food insecurity were associated with increased BMI. Among men, high food insecurity was associated with lower BMI ($\beta=-2.10$ ($SE=1.10$), $p=.05$) with no association between low food insecurity and BMI observed.

Conclusions:

Associations between food insecurity and BMI differed by gender, suggesting that different mechanisms contribute to excess weight among food insecure men and women.

O24.4**Does the relationship between family dinner frequency and parenting measures differ by race/ethnicity?****Authors:**

Natalie Poulos, Keryn Pasch, Natalie Golaszewski, Cayley Velazquez, Alejandra Fernandez, Alexandra Loukas

Purpose:

To examine the relationship between family dinner frequency and parenting measures (e.g. support, solicitation, and child disclosure) and determine if these relationships vary by race/ethnicity.

Methods:

Participants included 431 middle school students (m age=12.3; 61.3% female; 52.9% White). Students self-reported number of family dinners in the past week, 12 items on parental support, 5 items on parental solicitation, and 5 items on child disclosure, as well as, age, gender, race/ethnicity, height and weight. BMI z-scores were calculated from self-reported height and weight. Path analysis was used to determine associations between family dinner frequency and parenting measures. BMI z-score, age, and gender were included in the model as covariates. Race/ethnicity was tested as a moderator of the relationship.

Results:

Students reported a mean family dinner frequency of 4.98 times per week (m White=5.38; m Non-White=4.50; $p<0.001$). Overall model fit was excellent (Chi-square=19.85, $p=0.18$; CFI=0.995, RMSEA=0.02). In the overall model, family dinner frequency was positively associated with parental support ($p\leq 0.001$), parental solicitation ($p\leq 0.001$), and child disclosure ($p\leq 0.001$). When testing group differences by race/ethnicity, the models remained significant and positive, yet relationships were stronger among non-white youth as compared to white youth, suggesting moderation.

Conclusions:

Findings suggest that family dinners may be an ideal place to facilitate parent support, parent solicitation, and child disclosure between parents and youth. Given previous research, which suggests these parenting practices are protective against numerous risk behaviors, family dinners may be a useful intervention target not only for obesity prevention, but for other risk behavior prevention programs.

O24.5**Stress-environment interactions and snack food intake in black women in Chicago: An ecological momentary assessment study****Authors:**

Shannon Zenk, Ashley McDonald, Colleen Corte, Angela Odoms-Young, Irina Horoi, Barth Riley

Purpose:

Snack foods are major contributors to energy, fat, and added sugar intake, and Black adults tend to have higher intakes. Stress may contribute to snack food intake, but little is known about whether the environment triggers or exacerbates those effects. Using ecological momentary assessment, this study examined fluctuations in stress (daily hassles) and environmental context in relation to snack food intake in Black women ages 25-65 in Chicago (n=101).

Methods:

Women were signaled five times daily for seven days to complete a survey via smartphones (n=35 signals). Survey items included snack food intake (e.g., chocolate; dichotomized for analysis), daily hassles, and aspects of the food environment that "made it easier" to eat or drink, from which we derived these facilitators: Availability; inexpensive; near fast food restaurant, convenience store, or bakery; and near grocery store. Random effects logistic regression estimated relationships controlling for demographics.

Results:

Women consumed snack foods at 34.7% of the signals. Daily hassle frequency (OR=1.16) and severity (OR=1.24) were positively associated with snack food intake, and there were significant interactions between these hassle measures and perceived availability. Women were more likely to consume snacks in response to stress when they perceived it was easily available. While we found a main effect of fast food restaurant, convenience store, or bakery proximity and snack food intake (OR=2.08), it did not moderate hassle-snack food intake relationships.

Conclusions:

Environmental context may trigger or exacerbate effects of stress on snack food intake. Policies are needed to reduce exposure to energy-dense snack foods.

O24.6

Evaluative conditioning increases physical activity participation in Latina women

Authors:

Lorena Martin, Barbara Kahn, Andrew Perkins, Joseph Signorile, Soyeon Ahn, Arlette Perry

Purpose:

Epidemiological data have established that lack of physical activity increases risk factors for chronic diseases. Moreover, physical activity participation is lowest in underserved populations, particularly the Latino population. Attitudes are recognized as a factor, with negative attitudes being a deterrent to physical activity participation. However, research has shown that unproductive attitudes are malleable and can be altered through pairing of counter stereotypic images or words. This process is better known as Evaluative Conditioning (EC), the associative pairing of stimuli with the objective of either modifying or strengthening an association in memory. The purpose of this study was to examine the effects of EC as an innovative technological intervention in order to modify associations related to physical activity in Latina women.

Methods:

142 Latina women ($M \pm SD$, age 36.8 ± 15.9 yrs.) were randomly assigned to either EC or neutral conditioning (NC) while having unlimited access to a physical activity program for 12 weeks. An independent-samples t test was conducted to evaluate the hypothesis that EC would significantly increase physical activity in Latina woman compared to the NC group.

Results:

The t test was significant, $t(143) = 5.329$, $p = 0.000$. The Latina women in the EC group ($M = 807.7$, $SD = 471.4$) on average had greater physical activity participation (total minutes spent training) than those in the NC group ($M = 438.5$, $SD = 358.8$).

Conclusions:

EC may present an easily accessible and cost effective modality that may be used to increase physical activity in the Latina population.

O24.7

Process evaluation of Brighterbites pilot study: A community-academic partnership promoting fruit and vegetable intake among low-income, minority populations

Authors:

Katherine Albus, Shreela Sharma, Christine Markham, Mike Pomeroy

Purpose:

Brighterbites is a school-based program to increase demand for and intake of fruit and vegetables (FV) by providing continuous access to FV and nutrition education to families. Brighterbites was pilot tested among 3rd grade children and their families in Houston, Texas from 2012-2013. Our objective is to present results of the process evaluation collected during the pilot evaluation.

Methods:

Logs of produce distribution attendance, FV servings provided, and produce invoices were used to assess the quantity and cost of produce and dose received. Parent process surveys ($n=57$) administered after 8 weeks and 16 weeks were used to assess dose and participant satisfaction.

Results:

Brighterbites distributed fresh FV, nutrition education materials, and recipe samples to 57 families weekly for 16 weeks. On average, 61 servings of various FV were provided weekly, with average cost \$4.78 per family. Brighterbites experienced 96% retention over 16 weeks; 82% reported their family consumed more than half all FV provided in the

first 8 weeks, and 84% reported using over half all FV in the second 8 weeks. Seventy-five percent of participants rated the nutrition education materials as effective.

Conclusions:

Brighterbites is a feasible and acceptable program for promoting access to and literacy of FV to low-income, minority families. The program is a community partnership with the food bank to channel produce into underserved communities. By maximizing existing infrastructure at schools and food banks, program cost is low. A study to determine effectiveness of the program in changing family diet is currently underway.

Orals 25**Theory Determinants - Diet**

Moderator: Cassandra Diep

Affiliation: Baylor College of Medicine, Houston, Texas, USA

O25.1

Does basing an intervention on behavioral theory enhance the efficacy/effectiveness on dietary change for obesity prevention among children? A systematic review and meta-analysis

Authors:

Cassandra Diep, Tzu-An Chen, Vanessa Davies, Janice Baranowski, Tom Baranowski

Purpose:

To test whether interventions based on theory, multiple theories, or a formal planning process was more effective in changing fruit and vegetable (FV) consumption among children than interventions with no behavioral theoretical foundation or no formal planning.

Methods:

The authors conducted a systematic literature review through PubMed, PsycInfo, Medline, the Cochrane Collaborative database, and existing literature reviews and meta-analyses for FV interventions targeting children. After extracting data from each study, the authors ran analyses to assess differences in intervention effectiveness by theory use, number of theories, study quality, and formal planning process.

Results:

We screened 443 articles, of which 29 met inclusionary and exclusionary criteria for this study. Interventions based on a theoretical framework had significantly larger effect sizes for F, V, and FV combined consumption than interventions without a theoretical framework; however, there was no relationship between number of theories and intervention effectiveness. Studies with a formal planning process had a higher effect size for F, but a lower effect size for FV combined, than studies without a formal planning process. Higher quality studies had lower effect sizes for F and V than lower quality studies, but higher quality studies had a higher effect size for FV combined.

Conclusions:

Predicating an intervention on behavioral theory did enhance outcome effectiveness. There was mixed support, however, for enhanced dietary change with use of multiple theories or a formal planning process. More research is needed on the causal efficacy of theoretical variables to dietary behaviors to provide guidance for future interventions.

O25.2

Determinants of dietary behavior among youth: An umbrella review

Authors:

Ester Sleddens, Willemieke Kroeze, Leonie Kohl, Laura Bolten, Kees de Graaf, Johannes Brug, Stef Kremers

Purpose:

The literature on determinants of dietary behavior among youth is very extensive and has been summarized in various systematic reviews in recent years. We aimed to conduct an umbrella review to provide a more comprehensive overview.

Methods:

A search of electronic databases (PubMed, PsycInfo, Web of Science, Cochrane) resulted in 15601 citations. We included systematic reviews published in English between January 1990 and April 2013 that summarized determinants of observable child and adolescent dietary behavior (e.g., fruit and vegetable consumption, snacking, sugar sweetened beverage intake). The articles underwent independent screening by at least two of the authors. The data extraction included a judgment of the importance of determinants and strength of evidence and evaluation of the methodological quality of the eligible reviews.

Results:

In total, 16 reviews were considered eligible. The evidence gathered in our umbrella review suggests that social environmental determinants, intention, and sedentary behavior are important correlates of healthy and unhealthy dietary behavior. Other potential determinants of dietary behavior, such as automaticity, self-regulation, motivational regulation, and relationships with sedentary behavior have been studied in relatively few studies, but results are promising. Environmental determinants have been studied most extensively during the past decade.

Conclusions:

The multitude of studies conducted on determinants of dietary behavior provides mixed and sometimes quite convincing evidence regarding associations between potential determinants and a range of dietary behaviors. However, because of the often used weak research designs in the studies covered in the available reviews, the evidence for true determinants is suggestive at best.

O25.3

Results from a structural equation analysis on factors influencing eating behaviors in Ecuadorian adolescents

Authors:

Angélica Ochoa, Roosmarijn Verstraeten, Zuzanna Pieniak, Lea Maes, Patrick Kolsteren

Purpose:

Understanding culture-specific factors influencing adolescents' dietary behavior is essential to tailor health promotion interventions. We examined the direct and indirect associations of individual and environmental factors for adolescents' fruit and vegetable (F&V), sugary drinks, breakfast, and unhealthy snack intake.

Methods:

We conducted a cross-sectional study in 770 school-going Ecuadorian adolescents (aged 11 - 15 yrs). Data were collected on socio-economic status, anthropometry, dietary behavior and the factors influencing it. Direct and indirect associations of individual (attitudinal beliefs, self-efficacy, habit strength and perceived food safety) and environmental (availability, parenting and school practices) factors on F&V, sugary drinks, breakfast and unhealthy snack intake were modelled using structural equation analysis.

Results:

The hypothesized model performed well, indicating acceptable goodness-of-fit for both the measurement and structural model of each behavior. Within the model, parental permissiveness was directly and positively associated with sug-

ary drink intake (path coefficient (PC): -0.41). A direct link was found between the attitudinal belief that adolescents have a better body satisfaction when they eat healthily, and eating more vegetables (PC: 0.10). Body satisfaction also positively mediated the relationship between school support and adolescents' vegetable intake (PC: 0.23). A more supportive environment at school had a positive effect on breakfast consumption (PC: 0.12) and the perception of healthy foods being unsafe increased the consumption of unhealthy snacking (PC: -0.07), which was mediated by availability (PC: 0.10).

Conclusions:

Factors associated with eating behaviors in Ecuadorian adolescents differ amongst eating behaviors. These findings highlight potential points of leverage for developing future interventions.

O25.4

Exercise and weight loss may not be enough: Cortisol is elevated in women with pervasive body image concerns

Authors:

Lauren E. Salci, Kathleen A. Martin Ginis

Purpose:

High levels of cortisol are unhealthy and have been associated with low exercise levels and high body mass index (BMI) (Fraser et al., 1999; Traustadottir, Bosch, & Matt, 2005). Moreover, among young women, body image concerns may also increase afternoon cortisol levels (Martin Ginis et al., 2012; Putterman & Linden, 2006). This cross-sectional study examined whether body image plays a role in afternoon cortisol levels, independent of exercise and BMI.

Methods:

Thirty-eight women (M age=21.5 years) completed the Godin Leisure Time Exercise Questionnaire, the appearance orientation (AO) subscale of the Multi-dimensional Body Self Relations Questionnaire, and the appearance subscale of the Physical Self-Description Questionnaire (PSDQ). BMI was computed from measures of height and weight. Three afternoon salivary cortisol measurements were collected at 3, 6 and 9 hours after wake-up.

Results:

Hierarchical regression models were computed to predict cortisol at each timepoint. Only the model for 3 hours after wake-up was significant. For the first step, BMI ($\beta=0.36$) and exercise ($\beta=-0.33$) explained 15.7% of variance ($R^2_{\text{adjusted}}=10.9\%$), $p=0.05$. On the second step, AO ($\beta=0.33$) and PSDQ ($\beta=-0.36$) explained an additional 14.0% variance, $p=0.05$. The overall model explained 29.7% of the variance ($R^2_{\text{adjusted}}=21.2\%$) and was significant, $F(4,33)=3.49$, $p=0.02$.

Conclusions:

Women who were more attuned to, and less satisfied with their appearance had higher afternoon levels of cortisol after controlling for BMI and exercise participation. These results suggest that despite exercise and healthy weight management, women with pervasive body image concerns may be at risk for health complications associated with elevated cortisol levels.

O25.5

Does personality influence eating styles and unhealthy and healthy food choices?

Authors:

Carmen Keller, Michael Siegrist

Purpose:

A person's personality may be a risk factor for unhealthy eating styles and dietary patterns. Little is known about the influence of the five-factor model of personality on eating styles, and the concurrent influence of both on healthy or unhealthy food choices. A good understanding of these influences may be helpful for the development of successful interventions.

Methods:

A postal survey study was conducted in a random sample (N = 1,054) from the general population.

Results:

Controlling for age, gender and education regression analyses revealed that the personality factor openness to experience was associated with higher consumption of fruits, salad and vegetables and lower consumption of meat and sugar-sweetened drinks. The eating styles emotional and external eating were associated with higher consumption of sweet and savory foods, and external eating with higher consumption of meat and sugar-sweetened beverages. Neuroticism and conscientiousness were not significant predictors of food choices when eating styles were included in the analysis. However, neuroticism positively predicted emotional, external and restrained eating.

Conclusions:

Results suggest that personality factors and eating styles are important for adhering to healthy and unhealthy food choices. Personality traits of emotional instability such as neuroticism are stable and not easy to change. However, resulting counter-regulatory eating styles such as emotional or external eating might be easier and more successfully addressed. Previous research suggested for example physical activity to be a promising intervention measure to attenuate the negative influence of emotional eating on dietary behavior and weight control.

O25.6**Nutrition knowledge, diet quality and hypertension in a working population****Authors:**

Fiona Geaney

Purpose:

Some workplace dietary interventions prioritise nutrition education to increase nutrition knowledge. Uncertainty remains regarding the relationship between nutrition knowledge, dietary quality and diet-related disease risk. We measured nutritional knowledge and dietary quality in a working population and investigated if nutrition knowledge was a mediator between dietary quality and diet-related disease risk.

Methods:

Cross-sectional baseline data were obtained from a workplace complex dietary intervention trial, The Food Choice at Work Study. Participants included 837 random employees (18-64 years) recruited from four multinational manufacturing workplaces in Cork, Ireland. A validated questionnaire assessed nutrition knowledge. Dietary quality was measured using food frequency questionnaires from which a DASH (Dietary Approaches to Stop Hypertension) score was constructed. Objectively measured mid-way waist circumference was a proxy for diet-related disease risk. Linear regression analysis was conducted using SPSS 21.

Results:

Employees' nutrition knowledge was poor, with average scores of 70.5, 68.4 and 65.5 out of a possible 116, in managers, supervisors and non-managers/supervisors, respectively. Nutrition knowledge was significantly associated with dietary quality and the effect persisted after controlling for age and gender ($p < 0.001$). Nutrition knowledge was found to partially mediate the association between dietary quality and diet-related disease risk.

Conclusions:

Nutrition education is a worthwhile investment. Future workplace dietary interventions need to concentrate on improving employees' nutrition knowledge with effective education methods that are focused on group and individual learning. However, it is necessary to evaluate the long-term impact of these education methods on employees' nutrition knowledge, dietary quality and diet-related disease risk.

O25.7

Strategies to improve the willingness to taste: The moderating role of reward sensitivity

Authors:

Laura Vandeweghe, Sandra Verbeken, Ellen Moens, Leentje Vervoort, Caroline Braet

Purpose:

We investigated the effectiveness of different reward strategies and the role of reward sensitivity (RS) in willingness to taste (WtT) an unliked vegetable. The innovative part of this research lies in the combination of behavioral techniques and individual differences, and in the focus on WtT instead of change in liking. We consider WtT to be a crucial first step in the process of liking healthy food.

Methods:

Preschool children (n=132, 53% boys, age: M=4.51, SD=1.07) participated in a single-tasting experiment with unliked vegetables. They were randomly allocated to one of five different reward strategies: Encouragement, modeling (adult), modeling (puppet), token, and modeling+token. Using logistic regression, we tested the effect of reward strategies and RS on WtT (did not taste, hesitated to taste, and tasted immediately) and the moderating role of RS, indexed via the Behavioral Inhibition System and Behavioral Approach System Scales.

Results:

We found no main effect of reward strategies ($p > .1$) or RS ($p > .1$) indicating that WtT was not dependent on reward strategy or RS. However, we found an interaction effect between reward strategy and RS ($p < .05$): Children with a higher RS were more likely to taste in the token strategy.

Conclusions:

Rewarding is known as an effective technique to increase the consumption of healthy food. The present study suggests a differential effect of reward strategies depending on individual differences (i.e. RS). Focusing on both individual differences and behavioral techniques (i.e. reward strategies) might be a promising strategy for health promotion.

Orals 26

Food Policies & Environment

Moderator: Michelle Hashemi

Affiliation: University of Texas Health Science Center at Houston, Austin, TX, USA

O26.1

The relationship between the neighborhood food environment, children's diet, and children's weight status: A systematic review

Authors:

Michelle Hashemi, Eileen Nehme, Abiodun Oluyomi, Elizabeth Vandewater, Deanna Hoelscher

Purpose:

The majority of research on the built environment and weight status/diet has focused on adults, despite the high prevalence of childhood obesity. Some studies support the contention that the neighborhood food environment impacts children, but the findings are inconsistent. This paper's aim is to evaluate the existing body of literature on the relationship between the neighborhood and school food environments and child diet/BMI.

Methods:

A comprehensive, systematic search of online databases yielded 548 articles. Fifty-three articles met inclusion criteria, that: Population is children; outcome includes diet/weight/BMI; exposure includes spatial accessibility of food outlets surrounding the home/school; and measures for exposure-outcome associations exist. Articles were systematically assessed and compared based on study setting, methodological and statistical approaches used, and findings.

Results:

Over half of the studies were in the U.S., including 6 nationally representative studies. Participants were typically between 6-18 years old. Most studies were cross-sectional, and used GIS to assess neighborhood density (vs. proximity) of food outlets. They used objective measures to determine participant BMI. Regression analysis was the most common statistical method used. Thirty-seven of 53 articles found a positive association between density or proximity of food outlets and BMI and about 1/3 of the articles showed a negative relationship or no relationship.

Conclusions:

Our findings reflect that the relationship between the food environment and BMI is complex; however, this review suggests that food environment and diet/BMI are generally associated. This paper fills a gap in the subfield and could contribute towards public health policy initiatives.

O26.2**Field testing a nutrition environment assessment tool for food outlets in rural Texas****Authors:**

Marianna Gomez, Christina Thi

Purpose:

There are higher rates of obesity and chronic diseases in rural compared to urban areas in the US. The food environment should be accurately assessed to develop context-specific nutrition interventions that contribute to improved health outcomes in rural communities. Through this study, a unique tool was field tested that assesses prepared foods and food outlets accessed in rural Texas.

Methods:

The Texas Nutrition Environment Assessment in Restaurants (TxNEA-R) measures healthy and unhealthy menu items and barriers and facilitators to healthy choices. The tool was administered by 2 researchers and 12 research assistants in 4 rural communities and 44 traditional and non-traditional food outlets in central Texas. Inter-rater reliability was calculated to determine the level of agreement among raters of the same outlet and among survey items. Thematic analysis identified patterns in follow-up interviews, focus groups and comments from raters.

Results:

Inter-rater reliability ranged from 61.98% to 95.87%, with a mean percent agreement of 78.8%. The majority of survey items had a high percent agreement (75% or more), with the lowest percent agreement (25% or less) among items requiring counts (e.g. number of entrees served). Qualitative analysis confirmed these results and themes revealed areas for improvement in question wording and survey administration.

Conclusions:

TxNEA-R is a unique tool, capturing the nuanced food environment in rural Texas. Field testing provided sufficient data to further refine and re-test the tool to make it available for public use. It can serve as a model for developing tailored nutrition environment assessments in rural communities.

O26.3**First test and implementation of the government healthy food environment policy index to increase accountability and stimulate actions to create healthy food environments****Authors:**

Stefanie Vandevijvere, Boyd Swinburn

Purpose:

Within the International Network for Food and Obesity/NCDs Research, Monitoring and Action Support, a Government Healthy Food Environment Policy Index (Food-EPI) has been developed to assess and benchmark government policy implementation on food environments globally.

Methods:

The Food-EPI comprises a 'policy' component with 7 domains (food composition, labelling, promotion, provision, retail, affordability, trade) to create healthy food environments, and an 'infrastructure support' component with 7 domains (governance, leadership, workforce, monitoring, funding and resources, interaction platforms, health-in-all-policies) to strengthen prevention systems. Good practice statements have been proposed in all domains, which should evolve into international benchmarks established by governments at the forefront of implementing strong food policies.

Results:

The first test of the Food-EPI was organized in New Zealand in 2013. Policy documents and budgets were retrieved through websites and official information requests, and evidence on the extent of implementation of policies and infrastructure support was comprehensively documented. This was fed back to officials to verify completeness. A workshop was convened of 39 public health NGO representatives and academics, who rated, after presentation of the evidence, the degree of implementation against good practice for each statement and evaluated the difficulty of rating and the appropriateness/completeness of the evidence presented. Inter-rater reliability ranged from 0.57 (95% CI=0.51-0.63) (Fleiss' Kappa) to 0.85 (95%CI=0.81-0.88) (Gwet's AC1).

Conclusions:

The distributions of scores and the comments of the raters will allow further improving the Food-EPI, be fed back to government to stimulate and improve actions, and be used for comparison between countries and over time.

O26.4

Associations between relative and absolute measures of the food environment and fruit and vegetable consumption: Comparison of global and geographically weighted regression approaches in the ORiEL Study

Authors:

Christelle Clary, Daniel Lewis, Ellen Flint, Neil Smith, Yan Kestens, Steven Cummins

Purpose:

Little is known about whether relative or absolute measures of the food environment better predict dietary outcomes. Little is also known about whether using spatially explicit regression models such as Geographically Weighted Regression (GWR) may improve our ability to detect environmental effects. Here we test i) whether relative or absolute measures of the food environment better predict fruit and vegetable intake and ii) whether using a GWR approach reveals spatial variations in exposure-effect relationships undetectable in global models.

Methods:

Individual adult data from the baseline of The ORiEL Study (n=980) were used. Kernel density estimations were used to calculate relative and absolute density metrics of the food environment using an adaptive bandwidth of 5%. First we modelled whether density measures predicted fruit and vegetable consumption using linear regression. Second, we modelled the same relationship using geographically weighted regression. We controlled for socio-demographic co-variables.

Results:

We found little evidence for the effect of absolute measures, but relative measures performed strongly for fruit ($\beta=0.086$, $p=0.009$) and vegetable intake ($\beta=0.088$, $p=0.007$). A 10% point increase in the proportion of healthy outlets was associated with an increase of 1.74 portions of fruit and vegetable per day. Use of GWR revealed non-stationarity in exposure-effect relationships for fruit and vegetable intake and improved model fit. The magnitude of exposure-effect relationships varies spatially.

Conclusions:

Relative measures perform better than absolute measures of the food environment in predicting fruit and vegetable intake. The use of GWR may better detect the effect of environmental exposures on diet.

O26.5

Will students eat more fruits and vegetables if school policies include longer lunch periods or letting children play first?

Authors:

Nila Rosen, Keenan Fenton, Tracey Patterson, Lorrene Ritchie

Purpose:

Simple school policies that increase fruit and vegetable intake in children are needed. The study aim was to evaluate the relationship of duration of lunch and order of play and eating during the lunch period with fruit and vegetables (FV) intake. A secondary aim was to examine if differences existed in these relationships by student gender, ethnicity, language spoken at home, and school lunch source.

Methods:

A diary-assisted 24-hour recall was collected during the 2011-12 school year from 3,463 4th-5th graders attending 44 elementary schools in California. School lunch characteristics were attained from school staff and observation. The associations of play before eating and duration of lunch with FV intake were estimated using GEE.

Results:

FV intake did not significantly differ by lunch period length. Overall, lunch FV intake was not significantly higher for students who had a play before versus after eating lunch schedule. Variables in the model showed significant interaction with play before eating, requiring separate effect estimates by gender, ethnicity, language spoken at home, and lunch source. When a significant effect was predicted, play before eating had a positive impact among students who brought lunch from home.

Conclusions:

Play before eating may help some elementary students to increase FV intake although these and other environmental school policies need further rigorous evaluation.

O26.6

Food waste in a school nutrition program after implementation of new NSLP guideline

Authors:

Alisha Farris

Purpose:

The aim of this study was to assess the amount of food waste by meal components (main entrée (grain and meat), fruit, vegetable, milk) according to the new NSLP guidelines among early elementary students (pre-kindergarten and kindergarten). To date, no standards or goals for food waste have been set across any setting (i.e. schools, institutions, home). Food waste is an increasingly important issue to address, given attention on accountability of governmental resources coupled with costs of implementing the NSLP.

Methods:

For five consecutive school days, the research team collected school lunch trays and meal components were separated into bins relative to each food or beverage appearing on the school's daily menu. Food waste observations were made in one elementary school utilizing the NSLP guidelines.

Results:

Of 4,988 ounces of food and beverages served, 2,261 ounces (45.3%) were wasted during one full school week, totaling 141 pounds. The greatest amount of food waste was generated from vegetables, main entrée, and milk, respectively.

Conclusions:

This study represents the first school food waste study conducted since the implementation of the NSLP standards were put in place in fall 2012. This study can be used as a timestamp to compare food waste (and consumption) over time,

given the new requirements. Further studies are warranted to track food waste by individual child, reasons for food waste (e.g., serving sizes, time given to consume food, noise levels in cafeteria), and across different schools representing more diverse audiences (socio-economic status, race, ethnicity), along with other socio-ecological influences.

O26.7

Beverage policy in California childcare: It works!

Authors:

Lorrene Ritchie, Sushma Sharma, Ginny Gildengorin, Sallie Yoshida, Ellen Braff-Guajardo, Patricia Crawford

Purpose:

The California Healthy Beverages in Childcare law, implemented in January 2012, was designed to improve beverages served in all licensed childcare in the state. The aim of this study was to evaluate the impact of the law on beverages served to 2-5-year-old children in childcare. We hypothesized that beverages would improve as measured by more sites making drinking water available and serving only low or nonfat milk, and fewer sites serving sugar-sweetened beverages and serving 100% juice more than once daily.

Methods:

We randomly selected licensed childcare sites from official state registers and administered surveys to independent cross-sectional samples in 2008 (before the law) and 2012 (after the law). Responses (n=400 per survey) were compared using chi-square, logistic regression, or analysis of variance.

Results:

We found significant improvement in 2012 compared to 2008: More sites made water available indoors for children to self-serve (77% vs. 69%, $p=0.032$) and served water with meals/snacks (47% vs. 28%, $p=0.008$), and fewer sites served 100% juice more than once daily (20% vs. 27%, $p=0.038$) and served whole milk usually (9% vs. 22%, $p=0.006$). In 2012, 60% of sites were aware of a beverage law and 23% were judged fully compliant. Healthy beverage policy and information for families were cited as the main facilitators in improving childcare beverages.

Conclusions:

A positive impact on beverages served was found in California childcare after the implementation of a new beverage law. Efforts are needed, however, to continue to promote beverage policy and encourage greater compliance.

Orals 27

PA Measurement, Determinant & Interventions

Moderator: Marta M Marques

Affiliation: Faculty of Human Kinetics, University of Lisbon, Lisbon, Portugal

O27.3

Temporal patterns in accelerometer-measured physical activity (PA) among U.S. youth: Differences by weight status

Authors:

Britni Belcher, Erin Hennessy, Frank Perna, Kevin Dodd, Richard Troiano, James McClain

Purpose:

To describe accelerometer-measured PA by time of day, sex, & weight status in a nationally representative sample of youth.

Methods:

Included youth (6-19 years) from the 2003-6 National Health & Nutrition Examination Surveys had at least one 10+ hour weekday of accelerometer data (N=4852; 50% male). Temporal patterns were represented by segments that broadly reflect before (6-9am), during (9am-3pm), after school (3-6pm), & evening (6-9pm) time. Weight status groups were: Normal (5th-84th %ile), overweight (85th-94th %ile), & obese (≥ 95 th %ile). Statistics for mean counts per minute (cpm) were expressed for each time segment across all valid weekdays. Covariates were age, race/ethnicity, & sex. Sample weights accounted for the complex survey design.

Results:

From 6-9am, the count rate for overweight youth was higher than obese youth [mean cpm(SE)=212.7(15.1) vs. 186.5(11.5); $p<.05$]. From 9am-3pm, the count rate for normal weight youth was higher than obese youth [mean cpm(SE)=453.1(6.3) vs. 402.4(9.8); $p<.05$]. The largest significant rate differences between normal weight & obese youth occurred from 3-6pm [mean cpm(SE)=627.7(11.6) vs. 504.9(13.4); $p<.05$] & from 6-9pm [mean cpm(SE)=506.7(15.2) vs. 414.7(15.4); $p<.05$]. Patterns & relationships were similar by sex.

Conclusions:

Accelerometer count rate is highest in normal weight vs. overweight & obese youth throughout the day. Describing temporal PA patterns provide insight into times when interventions might be most effective. For example, between 3-6pm when there are the greatest differences between normal weight & overweight/obese groups. Such analyses also may help inform school policy decisions regarding physical education & recess time.

027.4**Go out and play: Children's outdoor time and context-specific physical activity by gender****Authors:**

Charlotte Klinker, Jasper Schipperijn, Jacqueline Kerr, Jens Troelsen

Purpose:

Being outdoors is as a correlate for enhanced physical activity (PA), but the association has seldom been investigated using objective measures. This paper investigates the association between week day outdoor time and context-specific moderate to vigorous PA (MVPA) by gender.

Methods:

Children (n=170, 11-16 years old) from the When Cities Move Children study who had outdoor time data and at least one valid day of 9 hours combined accelerometer and GPS data were included. Daily week day outdoor times and minutes of outdoor MVPA were calculated for a range of contexts; e.g. leisure, school, home, transport, school ground, clubs, playgrounds, recess. Multilevel analyses were used to assess gender differences and the association between outdoor time and MVPA.

Results:

Boys spent 29.0% of their daily time outdoors while 22.2% of girls' time was spent outdoors ($p<0.05$). The majority of outdoor time was accumulated in school followed by leisure. Boys accumulated 73.8% of their MVPA outdoors and girls 65.3% ($p<0.001$). A one hour increase in daily outdoor time was associated with 9.9 more minutes of daily MVPA. Across all investigated contexts an increase in outdoor time was associated with an increase in MVPA, with the strongest associations found for school grounds, sport facilities, urban green space and active transport ($p<0.001$ for both boys and girls).

Conclusions:

A strong and persistent association was found for outdoor time and the investigated context-specific places for MVPA. Future longitudinal studies are needed to establish the causal direction and inform policies.

027.5

The relationship between objectively-assessed and self-reported urban form characteristics and neighborhood-based walking in adults

Authors:

Elizabeth Jack, Gavin McCormack

Purpose:

Self-reported and objectively-assessed built characteristics are associated with physical activity, yet little is known about their combined influence on walking. This study: 1) estimated the relative associations between self-reported and objectively-assessed neighborhood characteristics and walking and; 2) examined the extent to which self-reported measures of the neighborhood built environment moderate associations between the objectively-assessed built environment and walking.

Methods:

A random cross-section of 1875 Canadian adults completed a telephone-interview and postal questionnaire capturing walkability, neighborhood-based walking, socio-demographic characteristics, physical activity-related attitudes, and residential self-selection. Each respondent's objectively-assessed neighborhood type was also determined (low [LW], medium [MW], and high walkable [HW]). Covariate-adjusted regression models estimated the associations between weekly participation and duration in transportation and recreational walking and self-reported and objectively-assessed walkability.

Results:

Compared with residents of objectively-assessed LW neighborhoods, residents of HW neighborhoods were more likely ($p < .05$) to participate in (odds ratio[OR]=3.06), and spend more time, per week (193 min/wk) transportation walking. Perceived access to services, street connectivity, motor vehicle safety, and mix of recreational destinations were also significantly associated with transportation walking. Perceived aesthetics was associated with participation in recreational walking (OR=1.18, $p < .05$). With regard to interactions, HW x utilitarian destination mix was positively associated with participation, HW x physical barriers and MW x pedestrian infrastructure were positively associated with minutes, and HW x safety from crime was negatively associated with minutes of transportation walking.

Conclusions:

Interventions that target perceptions in addition to modifications to the neighborhood built environment could result in increases in physical activity among adults.

027.6

A woman's work is never done: The role of gender in leisure-time physical activity

Authors:

April Keippel, Elizabeth Ciemins, Amanda Golbeck, Diane Duin, Dustin Dickerson, Tracy Neary, Dean Wells

Purpose:

Physical inactivity contributes to many health problems. Nationally, women report less physical activity than men. Gender, the socially constructed roles and activities deemed appropriate for men and women, is an important factor in women's physical inactivity. Through qualitative analysis, determine the gender-based factors which contribute to physical inactivity for women and identify gender-based opportunities which would enable physical activity.

Methods:

Focus groups of low-income women, teenagers, business women, new mothers, low-income seniors, active seniors, social service providers, migrant Hispanic women, and American Indian women and men were conducted and transcribed. The transcriptions were analyzed using inductive analysis procedures to determine common themes across focus groups.

Results:

Several gender-based constraints emerged including women's roles as caregiver which left little time or energy for physical activity, women's leisure time activities and hobbies such as knitting and reading which were less active than men's hobbies, and expectations for women's appearance which made them uncomfortable sweating in front of strangers. Gender-based opportunities included women's enjoyment of activity as a social connection, less rigid gender roles for younger women, and a sense of responsibility to set a good example for their families.

Conclusions:

While time is frequently mentioned as a barrier to physical activity for women, a deeper understanding of gender-based constraints and opportunities provide a framework for addressing specific issues related to time such as a woman's role as caregiver.

027.7**Family-based interventions to increase physical activity in children: A systematic review and realist synthesis****Authors:**

Helen Elizabeth Brown, Andrew Atkin, Kirsten Corder, Mai Chin A Paw, Jenna Panter, Geoff Wong, Esther van Sluijs

Purpose:

Despite the established health benefits, data suggest that many children are insufficiently active, and that levels decline into adolescence. Engaging the family may improve PA levels at this critical juncture. This review summarises the effect of existing family-based interventions to increase PA in children, using an innovative realist synthesis approach.

Methods:

Two authors independently screened peer-reviewed studies for inclusion based on (1) including 'healthy' participants aged 5-12y, (2) having a substantive intervention aim of increasing PA, (3) engaging the family, and (4) reporting PA change. Duplicate data extraction and quality assessment (EPHPP Quality Assessment Tool) was conducted. Realist syntheses were conducted according to RAMESES guidelines. A programme theory described the postulated causal pathway between interventions and changes in children's PA (including parental engagement, self-efficacy and awareness of children's PA).

Results:

Of 3252 titles screened, 43 interventions were included. Studies comprised 8-796 participants (mean age 5.9-12.6y). Quality assessment highlighted variability in study strength (selection bias and blinding were common limitations). Approximately 65% of studies reported significant improvements in PA (most measured by self- or proxy-reported questionnaire, or pedometers). Most effective interventions featured educational materials; other strategies included goal setting, group-based PA, and community events. Almost all successful interventions identified theoretical grounding (>30% based on Social Cognitive Theory), but only a subset measured hypothesised mediators and provided evidence on intervention mechanisms.

Conclusions:

Family-based interventions to improve PA in children show promise, but effective mechanisms remain unclear. Detailed analyses to evaluate overall effect size, and identification of moderating characteristics, are required.

Orals 28

Multiple Behavior Interventions in Adults

Moderator: Jennifer Tomasone

Affiliation: McMaster University, Hamilton, Ontario, Canada

O28.1

Key ingredients for “Changing Minds”: Determining the effective components of an educational intervention to enhance health care professional trainees’ social cognitions for discussing physical activity

Authors:

Jennifer Tomasone, Shane Sweet, Kathleen Martin Ginis, The Canadian Paralympic Committee

Purpose:

The Canadian Paralympic Committee’s Changing Minds, Changing Lives (CMCL) nationwide, seminar-mediated educational program is designed to change health care professional (HCP) trainees’ social cognitions for discussing physical activity (PA) with patients with a physical disability. This prospective study examined whether implementation variables influence changes in trainees’ social cognitions after attending a CMCL seminar.

Methods:

Trainees (n=564) attended 24 CMCL seminars and completed Theory of Planned Behavior (TPB) questionnaires assessing their attitudes, subjective norms, perceived behavioral control (PBC), and intentions for discussing PA with their patients at pre-, post-, 1-month and 6-months following a CMCL seminar. Key implementation variables were extracted from presenter demographic questionnaires and seminar checklists. Three-level hierarchical linear models were conducted to test the effects of the implementation variables on both pre-post and post-6 month (follow-up) changes in each TPB cognition.

Results:

Having a HCP presenter led to significant positive changes in trainees’ four TPB cognitions between pre-post seminar and significant negative changes in trainees’ attitudes and PBC over follow-up ($p < .05$). The number of seminars the presenter had delivered was a significant negative predictor of changes in attitudes and PBC during follow-up ($p < .001$). Adding an audiovisual component to the seminar was a significant positive predictor of change in attitudes between pre-post-CMCL seminar ($p < .001$).

Conclusions:

Findings suggest that experienced HCP presenters are not the ideal interventionists for long-term maintenance of trainees’ social cognitions for discussing PA. Future iterations of CMCL delivered to trainees should include an audiovisual component to maximize the seminar’s short-term impact on trainees’ attitudes.

O28.2

Process evaluation of a combined lifestyle intervention in Dutch primary care

Authors:

Brenda Berendsen, Marike Hendriks, Hans Savelberg, Nicolaas Schaper, Stef Kremers

Purpose:

A qualitative process evaluation is executed as part of a cluster randomized trial, which investigates the effectiveness and cost-effectiveness of a combined lifestyle intervention for people with overweight. The intervention consisted of one year coaching by a lifestyle advisor, physiotherapist and nutritionist. We studied implementation of the intervention in primary care, to gain insight into factors that might influence effectiveness and cost-effectiveness.

Methods:

The evaluation was based on frameworks for health promoting interventions. Main topics were content of provided coaching, interdisciplinary collaboration and performance according to protocol. Interviews were conducted with the professionals (n = 28) of a representative selection of locations that implemented the intervention. In addition, patient information was retrieved by means of questionnaires.

Results:

Professionals adjusted coaching to personal needs and wishes of participants, to increase feasibility and participants' satisfaction. Both amount of tailoring and participants' satisfaction with coaching differed between locations. Health issues were common reasons for drop-out. Younger, non-Dutch and unemployed participants were more often lost to follow up. Interdisciplinary collaboration within the intervention was appreciated by most professionals and continued after the study. Financial reimbursement reinforced the continuation of the intervention.

Conclusions:

The amount of protocol adherence by professionals varied. Tailoring might decrease risk of participant drop-out and thereby influence costs and effects. Whether locations continued to offer the intervention seemed dependent on funding and on involvement of professionals in the team. Having good collaboration in multidisciplinary teams seems to be a success factor and improves chances for continuation of implementation.

O28.3

Can improvements in fat and fibre intake, physical activity and weight loss be maintained two years after a type 2 diabetes prevention program?

Authors:

Philip Vita, Stephen Colagiuri

Purpose:

To assess if participants who completed a one-year type 2 diabetes prevention program, reduce, increase or maintain weight, fat and fibre intake and physical activity three years after it began.

Methods:

Primary health care physicians recruited 50-65 year olds at high risk of diabetes into a three session group-based life-style modification intervention aimed at improving nutrition (decreasing total fat and saturated fat, increasing fibre), increasing physical activity and 5% weight loss. Weight, physical activity (Physical Activity Scale for the Elderly (PASE)), and fat and fibre (using a validated index) were measured and compared (using repeated measures analysis) at baseline and annually for a further three years.

Results:

At one year follow up there was significant weight loss (2 kg; $p < 0.05$) among the 850 participants (mean age 59.4 years, 68% female) who completed the program. Both physical activity and fibre intake increased ($p < 0.01$), while fat intake decreased ($p < 0.01$). Mean weights were stable at one- (83.6 kg), two- (85.1 kg) and three- (84.9 kg) year follow up among the 658 participants with complete data. Physical activity and fibre intake decreased over time ($p < 0.01$), while fat intake did not change.

Conclusions:

At three year follow up weight loss and fat intake was maintained, while fibre intake and physical activity decreased. Ongoing support may be required to maintain improvements in physical activity and diet. Moreover, policy and environmental changes which facilitate healthy eating and encourage physical activity may also be necessary to maintain healthy behaviors.

O28.4

The StrongWomen Change Club: Engaging residents to catalyze positive change in food and physical activity environments

Authors:

Rebecca Seguin, Mackenzie Sehlke, Eleanor Heidkamp-Young, Mark Fenton, Sara Folta, Miriam Nelson

Purpose:

The StrongWomen Change Club was an academic-community research partnership focused on creating community-level physical activity and nutrition environment changes through collaborations with cooperative extension educators. It was guided by community-based participatory research principles.

Methods:

The first stage of the project was leader identification in seven predominantly small/rural U.S. towns. Each local leader recruited groups of 10-15 residents, called Change Clubs (CC), to undertake a project to change a nutrition or physical activity environment issue within their community. All individuals had limited (or no) experience in civic engagement and/or policy work. The project team facilitated the CC through 1) a structured planning, visioning, stakeholder identification, asset mapping, goal/benchmark setting, and action steps process; 2) awareness activities focused on food and physical activity environments, personal habits, and potential areas for improvement; and 3) team-building exercises.

Results:

At the 6- and 12-month post-implementation time points, the research team conducted key informant interviews with each CC leader. At 12 months, all had accomplished one benchmark; the majority had completed at least three benchmarks. Common themes of benchmark achievement included building relationships and leveraging stakeholder partnerships. For example: "Our CC worked with a state senator, borough mayor, city mayor, and the department of transportation." Barriers to benchmark achievement included busy schedules and resistance/slow pace to community change. For example: "The bureaucracy is state, local, borough. It makes the process slow."

Conclusions:

Community change initiatives that involve stakeholders, build upon existing activities and resources, and establish feasible timelines and goals can catalyze positive environmental change.

O28.5

The design, development and feasibility testing of an interactive digital intervention to promote physical activity and healthy diet in retirement

Authors:

Martin White, Nicki Hobbs, Ben Heaven, Elizabeth Evans, Gemma Teal, Paula Moynihan, Falko Sniehotta, John Mathers

Purpose:

Retirement from work impacts on physical activity (PA) and dietary behaviors, and offers a window of opportunity to intervene. We aimed to develop and optimise an intervention to promote PA and diet during this transition.

Methods:

Key stakeholders (older adults as intervention users, potential providers, commissioners and researchers) were involved in intervention development and optimisation through a co-design process. Co-design methods were used to integrate evidence from qualitative research and systematic reviews (effectiveness of interventions to promote PA, Mediterranean dietary patterns and social roles) to develop and prototype intervention proposals. An iterative process of intervention testing and optimisation was then undertaken, and mixed methods were used to establish intervention usability and feasibility.

Results:

An interactive digital intervention was developed comprising five modules: PA, eating well and social relationships, complemented by time reflection and work transitions. The role of a mentor was identified as important to support user experience and was included as a virtual feature. Feasibility testing resulted in optimising the functionality, modality (PC, smartphone, tablet), and content of the intervention. Links between the PA, eating well and social relationships modules were added. The feasibility and acceptability of the refined intervention has been demonstrated with users at different stages in the retirement transition.

Conclusions:

An iterative process of intervention design, development and optimisation with key stakeholders has resulted in a digital lifestyle intervention that is theoretically sound, evidence-based, usable and engaging for older adults. A pilot RCT is planned to provide a platform for a future definitive RCT.

O28.6**Mindfulness-based interventions for obesity-related eating behaviors: A review of empirical findings****Authors:**

Gillian A. O'Reilly, Lauren Cook, Donna Spruijt-Metz, David S. Black

Purpose:

Mindfulness-based interventions (MBIs) represent a set of secular meditation training practices intended to increase nonjudgmental attention to the present moment. Given that these training practices increase acuity to eating practices and sensitize one to linkages between thoughts, emotions, and eating behaviors, targeting change in eating behaviors through MBIs has recently gained popularity. This is the first literature review to date conducted to determine the effectiveness of MBIs for treating obesity-related eating behaviors including binge eating, emotional eating, external eating, and dietary intake.

Methods:

Inclusion criteria for articles were: Employ a MBI, (2) include at least one obesity-related eating behavior as an outcome, (3) include quantitative outcomes, (4) be published in English in a peer-reviewed journal. Twenty-one articles were reviewed.

Results:

Eighteen (86%) studies reported improvements in targeted eating behaviors. Of twelve studies that targeted binge eating, eleven reported improvements (average Cohen's $d=1.39$). Of eight studies that targeted emotional eating, five reported improvements (average Cohen's $d=0.67$). Of six studies that targeted external eating, four reported improvements (average Cohen's $d=0.65$). Two of three studies that targeted dietary intake reported improvements (effect sizes not reported). Of ten studies that included body weight outcomes, nine reported improvements, with an average weight loss of 4.5 kg (average Cohen's $d=0.19$).

Conclusions:

These findings provide evidence to support the use of MBIs for obesity-related eating behaviors. Given the extent of the obesity epidemic, novel approaches to support obesity-related eating behaviors are needed. MBIs are poised to complement obesity prevention and treatment efforts.

O28.7

Comparative efficacy of simultaneous versus sequential multiple health behavior change interventions: A systematic review

Authors:

Erica James, Natalie Johnson, Corneel Vandelanotte, Camille Short, Luke Wolfenden

Purpose:

While increasing evidence points to the benefits of addressing multiple health behaviors, it is not clear how we should attempt to change more than one behavior at a time. Treating behaviors simultaneously may be too demanding for participants and undermine efforts to change individual behaviors; leading some researchers to suggest that a sequential approach may be preferable. This review evaluates the relative efficacy of simultaneous and sequential interventions for treating multiple health behaviors.

Methods:

Review methods were conducted in accordance with PRISMA guidelines. Eligibility criteria, search strategies and study selection were specified a priori. Four databases; Embase, Medline, CINAHL and PsycInfo, were searched for papers published between 2000 and November 2013. Risk of bias and data extraction were performed independently by two reviewers using standardised forms.

Results:

Six eligible trials were identified. Three studies targeted alcohol and tobacco, two targeted diet, physical activity and smoking, and one targeted diet and physical activity. Findings were mixed. Two of the six studies favoured the simultaneous intervention, two favoured sequential treatment, while two found no difference. In all cases, differences were limited to one behavioral outcome, and these differences were not maintained long-term. There was substantial heterogeneity in the behaviors targeted, study quality, target populations, and in the spacing of sequential interventions. Due to the heterogeneity of studies, meta-analysis was considered inappropriate.

Conclusions:

Neither approach is superior, further research is required to identify circumstances in which either approach may be more appropriate.

Orals 29

Measurement of PA in Children

Moderator: Meghan M. Senso

Affiliation: Department of Epidemiology and Community Health, University of Minnesota, Minneapolis, MN, USA

O29.1

Demographic, child health, and parenting predictors of accelerometry wear time in preschool-aged children

Authors:

Meghan M. Senso, Nancy E. Sherwood, Simone A. French, A. Lauren Crain, Sarah E. Toov, Nathan R. Mitchell

Purpose:

Accelerometry is the preferred methodology to measure free-living physical activity in children. Concerns about bias as a function of wear time have arisen, including differential compliance by child/family characteristics and a potential association between measured activity levels and wear time. To explore predictors of wear time and associations with moderated-to-vigorous physical activity (MVPA) in 396 preschool-aged children participating in an obesity prevention RCT.

Methods:

Child wear time was defined as minutes of wear averaged across seven 24-hour days. Child MVPA was calculated as daily

minutes and daily percent of wear time. Anthropometry was staff-measured. All other variables were measured via parent interview. Wear-time associations were analyzed using general linear regression.

Results:

Mean (SD) daily wear time was 963(276) minutes. Three-year-olds wore the accelerometers less than 2-year-olds ($p < .01$) but not statistically less than 4-year-olds ($p = .11$). Males recorded more wear time than females ($p = .03$). Parent education ($p = .03$) and income ($p = .01$) were positively associated with wear time. Speaking English ($p = .02$) and years parent lived in US ($p < .01$) were positively correlated with wear time. Average daily minutes of MVPA was correlated with average daily minutes of wear time ($p < .01$); wear time was not statistically associated with child BMI, TV time, or ethnicity, or parent age, sex or parenting styles.

Conclusions:

Child wear time varied by child- and parent characteristics, and wear time was correlated with minutes of MVPA. Implications for reducing bias reporting and measuring accelerometry data in preschool children are discussed.

029.2

Validity of the ActivPAL monitor in measuring sitting and standing in school children

Authors:

Saeideh Aminian, Erica Hinckson

Purpose:

To examine the validity of the ActivPAL monitor in assessing free-living sitting/lying, standing, and stepping time, and counting transitions and steps in children at school.

Methods:

Seventy five healthy school children (age 7.9 ± 1.2 years; BMI 20.6 ± 4 ; mean \pm SD) were recruited from one elementary school in Auckland, New Zealand. Children were videotaped wearing the ActivPAL in school hours to capture sedentary and physical activities during classroom lessons. Pearson's correlation coefficient and Bland and Altman analyses were used to investigate the validity of the ActivPAL against direct observation.

Results:

We observed a high correlation ($r = 0.81 \pm 0.07$) between the ActivPAL in time spent sitting/lying in classroom free-living activities with direct observation. Correlations between the ActivPAL and video observation in classroom standing and stepping time, and numbers of sit-to-stand transitions, stand-to-sit transitions, and steps were moderate; ($r = 0.78 \pm 0.08$), ($r = 0.77 \pm 0.08$), ($r = 0.58 \pm 0.13$), ($r = 0.61 \pm 0.12$), and ($r = 0.77 \pm 0.08$) respectively.

Conclusions:

The ActivPAL monitor is a valid device for assessing time spent sitting, standing, and stepping, and transition and step counts in school children.

029.3

Reporting reliability of accelerometer data with and without missing values

Authors:

Eric Wickel

Purpose:

Participants with complete accelerometer data often represent a low proportion of the total sample and, in some cases, may be distinguishable from participants with incomplete data. Because traditional reliability methods characterize the consistency of complete data, little is known about reliability properties for an entire sample. This study employed generalizability theory to report an index of reliability characterizing complete (7 days) and observable (1 to 7 days) accelerometer data at ages 9, 11, 12, and 15 years.

Methods:

Accelerometer data from the Study of Early Child Care and Youth Development were analyzed to report daily estimates of moderate-to-vigorous physical activity using minimum wear time criteria of 6, 8, 10, and 12 hours. Missing value analyses were conducted to describe the pattern and mechanism of missing data. Generalizability coefficients were derived from variance components to report reliability parameters for complete data and also for the entire observable sample. Analyses were conducted separately by age and wear time.

Results:

Participants with complete data were limited (< 34%) and, most often, the data were not considered to be missing completely at random (Little's statistic < 0.05). Across conditions, reliability coefficients for complete data were between 0.74 and 0.87. Relatively lower reliability properties were found across all observable data, ranging from 0.52 to 0.67.

Conclusions:

A reliability coefficient that includes all participants, not just those with complete data, provides a global perspective of reliability that could be incorporated into disattenuation formula to further understand group level associations between activity and health outcomes.

029.4**Comparison of physical activity measurement using smartphone-based and wrist worn accelerometers****Authors:**

Kacie CA Blackman, Yong Jun Kwon, A. Katrin Schenk, Paul A. Estabrooks

Purpose:

The objective of this study was to compare accelerometer data taken with an onboard accelerometer in a smartphone (Droid A855) with accelerations recorded by a stand-alone accelerometer (ActiGraph GT3x+).

Methods:

A smartphone application was developed to record the time varying acceleration from the Droid's onboard three-dimensional accelerometer. Twenty-seven adolescents wore an ActiGraph on their non-dominant wrist. Each adolescent played three smartphone-based games (e.g., Fish Out of Water, Space Rayders, and Color Hunt) that were designed to promote physical activity (PA). Each game was played 30 minutes a day on each, 4 days in a single week. Activity counts and the sum of the absolute value of the difference (SAD) calculations were employed to calculate PA from the Droid data. Regression analyses were used to assess the correlation between the Droid data and that collected by the ActiGraph.

Results:

Droid-based assessment of physical activity in terms of activity counts ($R^2=0.63$) and SAD ($R^2=0.57$) were significantly related ($p<.05$). While the activity counts and SAD values increased with Actigraph counts for all game, the strongest relationships were with ActiGraph activity measures for Fish Out of Water, a game that encouraged fast walking/running in short distances ($R^2=0.64$ activity counts; $R^2=0.68$ SAD).

Conclusions:

This study demonstrated that a smartphone accelerometer application can be used to record PA data that is correlated with the ActiGraph. These results suggest that the onboard accelerometers in ubiquitous computing devices like mobile phones may be a reliable method to assess PA levels and contribute to activity promotion and monitoring.

Orals 30

School-Based Policies and Practices on PA and Nutrition

Moderator: Elena Serrano

Affiliation: Virginia Tech, Blacksburg, VA, USA

O30.1

Cost of Food Waste in the School Lunch Program

Authors:

Elena Serrano

Purpose:

While these new National School Lunch Program standards help promote dietary quality among children, many of these foods are more costly to program and many report more food waste. Existing studies on school food waste are based on previous standards and few to none include analysis of waste cost. The aim of this study was to assess the cost of food waste by food and beverage category within the NSLP among early elementary students.

Methods:

One pre-kindergarten and five kindergarten classes from a single public elementary school were recruited to participate in the study for one week. Waste cost was calculated by multiplying the cost per serving by the number of servings wasted. Once all cost calculations were complete, waste cost was compared to total serving cost, and percentage of waste was determined.

Results:

Cost calculations show that a total of \$219.99 of served food was wasted, which results in approximately \$0.72 wasted per child. Vegetables showed the highest percentage of cost, and fruit the least percentage of cost. The highest amount of waste was of side salad, with \$38.24 wasted, and potato medley, with \$23.01. Apple and orange juice is included in the fruit category, but showed a higher amount of waste than whole fruits, with a total of \$14.84 waste cost.

Conclusions:

Further research should explore the cost of disposed, un-served food, and more food waste studies in schools. Identifying ways to reduce food waste in schools will allow for less cost, labor and transportation of food.

O30.2

Quality and implementation assessment of the Mexican national nutrition and physical activity school policy guidelines

Authors:

Margarita Safdie, Lizbeth Tolentino-Mayo, Karla Galaviz, Simon Barquera, Rebecca Lee, Lucie Levesque

Purpose:

Childhood overweight and obesity are a public health concern in México. In 2009, the Mexican Ministry of Health (MOH) developed the Mexican National Strategy for Overweight and Obesity Prevention following the model proposed by the WHO Diet and Physical Activity Strategy (DPAS) through the WHO School Policy Framework. The National Strategy includes school-specific recommendations and regulations (ANSA School Guidelines) related to the promotion of healthy eating and Physical Activity (PA) within schools. To assess the quality and implementation of the ANSA School Guidelines in 20 Mexico City elementary schools.

Methods:

All ANSA policy related documents (e.g., white papers) were coded by three experts using Hogwood and Gunn's (1984) 10 preconditions to perfect implementation. Sixty school key informants provided information on policy implementation during the 2011-2012 school year based on a questionnaire guided by the WHO School Policy Framework criteria.

Results:

Only Sixty percent (n=6) of the implementation pre-conditions were partially met; some ambiguity in the ANSA School Guidelines content, particularly surrounding funding allocation, implementer training, and task enforcement were identified. The ANSA School Guidelines mostly complied with WHO international recommendations according to the WHO School Policy Framework but the specific nutrition and PA components of the guidelines were not fully implemented within our sample.

Conclusions:

This study highlights areas for improvement in the ANSA School Guidelines policy. These findings suggest that the early implementation of the ANSA School Guidelines has not been successful and calls for an urgent institutionalization of new actions within the Mexican school system.

O30.3**Obesity prevention policies and practices in Australian primary schools 2006-2013: How far have we come?****Authors:**

Nicole Nathan, Luke Wolfenden, Christopher Williams, Sze Lin Yoong, Andrew Colin Bell, Rebecca Wyse, Rachel Sutherland, John Wiggers

Purpose:

Despite significant investment over the last decade, the extent to which schools have implemented healthy eating and physical activity policies and practices has not been routinely reported. The aims of this paper are to; describe the prevalence of healthy eating and physical activity policies and practices in Australian schools over time and; to determine if school size, rurality or socio-economic location influences practice adoption.

Methods:

Over an eight year period, a representative randomly selected cohort of primary schools in NSW, Australia (n=476) participated in four telephone surveys regarding their implementation of 8 healthy eating and 7 physical activity policies and practices. Repeated measures logistic regression in a GEE framework was undertaken to examine trend over time.

Results:

Between 2006 and 2013 there was a significant increase in the number of schools adopting all eight healthy eating practices; vegetable and fruit breaks was the largest (42.6% to 88.5%, $p<0.0001$). Of the seven physical activity practices, only one significantly improved over time i.e. schools provision of playground markings and sports equipment during recess and lunch (52.3% to 70.2%, $p<0.0001$). Adoption of practices did not significantly differ by school characteristics.

Conclusions:

Government policy/ investment can equitably improve school adoption of obesity prevention policies and practices on a jurisdiction-wide basis. Additional and/or different dissemination strategies may be required to increase adoption of physical activity practices. Routine monitoring of such outcomes over time is needed to ensure the intended benefits of government policy and investment are achieved, and the need for remedial action identified.

O30.4**CDC's school-based surveillance of school healthy eating and physical activity policies and practices****Authors:**

J. Edward Coffield, Sarah Lee, Caitlin Merlo, Nancy Brener

Purpose:

In the U.S., CDC monitors the status of healthy eating and physical activity (PA) policies and practices in schools through the School Health Policies and Practices Study (SHPPS) and School Health Profiles surveillance system (Profiles). These systems provide information about the degree to which schools are developing and implementing recommended health policies and practices. The purpose of this presentation is to highlight 2012 results from SHPPS and Profiles.

Methods:

SHPPS is the largest, most comprehensive assessment of school health programs in the U.S. CDC developed six state-level and seven district-level web-based questionnaires. Education agencies for all 50 states and DC were invited to participate in the 2012 SHPPS survey. At the district level, a nationally representative sample of public school districts was selected in a single phase. Profiles is a system of surveys assessing school health policies and practices in states, large urban school districts, territories, and tribal governments. Profiles consists of questionnaires for the principal, lead health education teacher, and lead physical education (PE) teacher. Profiles employs random, systematic, equal-probability sampling strategies to produce representative samples of schools that serve students in grades 6-12 in each jurisdiction.

Results:

In the context of CDC's guidelines, presenters will report state and district 2012 SHPPS data on school PE, PA, nutrition services, and nutrition environment. Additionally, presenters will report 2012 Profiles data on PA, PE, and nutrition practices in schools.

Conclusions:

Jurisdictions are making progress on CDC school nutrition guidelines, while there is room for further improvement on PA guidelines.

Orals 31

Intrapersonal and Environmental Determinants of Dietary Intake of Children and Families

Moderator: Kimberly Rollings

Affiliation: University of Notre Dame, Notre Dame, IN, USA

O31.1

Cafeteria Assessment for Elementary Schools (CAFES): Development of a tool to assess environmental factors relevant to children's dietary intake

Authors:

Kimberly Rollings, Nancy Wells

Purpose:

The Cafeteria Assessment for Elementary Schools (CAFES) tool was developed to quantify physical attributes of cafeteria environments at four scales: Room, table, plate, and food. CAFES offers a valid, reliable, and objective tool to assess the need for and effectiveness of environmental interventions based in environmental psychology and behavioral economics strategies linked to selection and consumption of fruits and vegetables (FV).

Methods:

Data were collected from 50 low-income elementary schools and 2,000 National School Lunch Program participants in four states. Demographic, cafeteria, and FV serving and consumption data were collected from students and their parents, observations, and lunch tray photography, respectively. Reliability and predictive validity analyses were performed using Kuder-Richardson-21 coefficients (internal consistency) and multi-level modeling.

Results:

Reliability (KR-21) of CAFES and the four scales was 0.88 (CAFES), 0.80 (room), 0.72 (table), 0.83 (plate), and 0.58 (food). Room-level subscales included ambient environment, appearance, fenestration, layout/visibility, advertising/signage, and kitchen/serving area factors. Table-level subscales consisted of furniture, availability, display layout and presentation, serving method, and variety. Multi-level modeling indicated that the total CAFES score, four scale scores, and various subscale scores significantly predicted FV served and consumed.

Conclusions:

By identifying environmental attributes associated with healthy eating at multiple scales, CAFES identifies critical areas

for intervention; suggests low- and no-cost intervention strategies; and contributes to guidelines for cafeteria design, food presentation and layout, and operations aimed at promoting FV consumption among elementary school students.

O31.2

The out of the box intervention: The complexity of family food culture

Authors:

Sophie Carty, John Coveney, Louise Mainvil

Purpose:

This research aimed to explore factors that influence fruit and vegetable consumption in low- and high-income households. If fresh fruit and vegetables were available, accessible, and affordable, what other resources would households need to consume more fruit and vegetables?

Methods:

An adapted ethnographic approach was used to observe twenty households in their home environment. An even number of low- and high-income households representing a range of household types were purposively selected. Each New Zealand household received a free box of fresh fruit and vegetables each week for three months, delivered to their home, and were home-visited twice a week by a researcher. An inductive thematic analysis of data collected from five low-income and five high-income households with children was conducted using MAXQDA software.

Results:

The data was organised under five major themes to describe factors influencing household fruit and vegetable consumption. Family food cultures were dynamic and influenced by available resources. Even when free produce was delivered to the home, families required human resource (personal drivers influenced by early life exposure and household dynamics) and external social networks to make use of them. When resources were limited within a household, there was a greater dependence on external organisations.

Conclusions:

Researchers, policy makers and practitioners attempting to improve the eating habits of low-income families need to consider the breadth of resources households need to achieve this outcome (not simply financial resource) and the complexity of resource access and utilisation in an evolving home environment.

O31.3

Food swamps and food desserts: Associations with dietary behaviors among urban adolescent girls

Authors:

Erin Hager, Nicole O'Reilly, Laura Hungerford, Kristen Hurley, Maureen Black

Purpose:

To determine if living in a food desert (no grocery store within 0.25miles of home) or food swamp (>4 corner stores/fast food within 0.25miles, but no grocery store) is associated with consumption of fruits, vegetables, or snacks/desserts among adolescent girls.

Methods:

Adolescent girls (6th and 7th grade) were recruited from urban, low-income, predominantly African American schools. Height and weight were measured in triplicate, and BMI-for-age %tiles were plotted. The Youth/Adolescent Food Frequency Questionnaire was administered and servings per day of fruits, vegetables, and snacks/desserts were calculated. Home addresses were provided by caregivers and geocoded in ArcGIS. Existing maps including location and type of food outlets were provided by the local planning department. Number of grocery stores and corner stores/fast food within 0.25mile radius of home were calculated, exported, and merged. Bivariate associations were examined. Linear and multinomial regression models were used to examine associations, adjusting for covariates.

Results:

781/789 addresses were geocoded. 634 had dietary data (80.4%). Sample: 52.4% overweight/obese ($\geq 85^{\text{th}}$ tile), mean age 12.1 (range 10.1-14.7). 89.4% lived in a food desert, 36.8% lived in a food swamp. Mean servings consumed of fruit=1.2+1.1, vegetables=1.7+1.4, and snacks/desserts=3.4+2.5. Diet was not associated with living in a food desert. Participants living in a food swamp were more likely to consume additional servings of snacks/desserts ($b=0.57$, $p=0.016$) adjusting for age and overweight/obesity.

Conclusions:

Adolescent girls living in food swamps were more likely to consume additional snacks/desserts. Dietary interventions should consider the built environment surrounding one's home when addressing adolescent dietary behaviors.

031.4**Socioeconomic position moderates predictors of 9 to 13 year old children's non-core food and sweetened drink intake****Authors:**

Dorota Zarnowiecki, Natalie Parletta, James Dollman

Purpose:

Children of low socioeconomic position (SEP) consume poorer diets than children of high SEP, but there is limited understanding of why socioeconomic gradients in diet occur. Evidence suggests that predictors of dietary intake may differ between SEP groups. The aim of this study was to determine if SEP moderated associations of personal and environmental predictors with children's non-core food and sweetened drink intake.

Methods:

N=395 children aged 9-13 years and parents were recruited in Adelaide, South Australia. Intrapersonal and environmental predictors of children's diet were measured using child-completed online questionnaires and telephone interviews with parents. Dietary intake was measured using a semi-quantitative FFQ. Correlated component regression was used to identify dietary predictors, which were subsequently tested for moderation by SEP using Partial Least Squares Structural Equation Modelling.

Results:

Multiple personal and home environment factors predicted non-core food intake, and were moderated by SEP. Education, occupation and employment moderated associations of boys' non-core food intake with parents' self-efficacy (Education: $B=-0.16$, $p=0.01$; Occupation: $B=0.14$, $p=0.01$; Employment: $B=0.19$, $p=0.01$) and monitoring (Education: $B=-0.12$, $p=0.01$; Occupation: $B=0.21$, $p=0.01$; Employment: $B=0.26$, $p=0.001$). Associations of girls' sweetened drink intake with pressure to eat were moderated by all SEP variables (Education: $B=-0.19$, $p=0.003$; Income: $B=-0.26$, $p<0.001$; Occupation: $B=0.19$, $p=0.001$; Employment: $B=0.16$, $p=0.02$).

Conclusions:

Identifying differences in dietary predictors between socioeconomic groups improves understanding of why socioeconomic gradients in dietary intake occur. Tailoring interventions and health promotion to the particular needs of different socioeconomic groups may produce more successful outcomes and reduce socioeconomic disparities in dietary intake.

Orals 32

Technology and Health Across the Lifespan

Moderator: Margaret Demment

Affiliation: Cornell University, Ithaca, NY, USA

O32.1

How is an online pregnancy intervention used and by whom?

Authors:

Margaret Demment, Meredith Graham, Christine Olson

Purpose:

Online interventions have emerged as a popular strategy to promote healthy behaviors and provide a unique opportunity to objectively measure engagement. Currently, there is little agreement about how best to measure online-intervention engagement and if engagement differs across sociodemographic characteristics. The aims of this study were to: 1) create multiple measures of engagement; 2) identify sociodemographic profiles of users; and 3) examine the association between these profiles and engagement.

Methods:

A sample of racially and socioeconomically diverse pregnant women were assigned to the intervention in a randomized controlled trial to prevent excessive gestational weight gain (n=1014). The intervention website included these features: Weight-gain tracker, health-related articles, blogs, physical activity and diet goal setting tools, and local resources. Engagement variables were created to capture amount, consistency, and patterns of feature use across pregnancy through latent-class analysis. Sociodemographic profiles were created through latent-class analysis using variables collected during screening. Differences in engagement across profiles were examined using chi-squared analysis.

Results:

Through the use of multiple measures of engagement we found differences in engagement across sociodemographic profiles. Use of the weight tracking was high and ranged from 42% to 89% across sociodemographic profile groups. Consistent weight tracking was lower, ranging from 8% to 37%, with the highest use by women who are white, normal body mass index, not low-income, and >30 years.

Conclusions:

While the less disadvantaged women had higher engagement in general, depending on the measure there was still considerable engagement even for the most disadvantaged women.

O32.2

Effectiveness of a web- and mobile phone-based intervention to promote physical activity and healthy eating in middle-aged males: Outcomes of the ManUp Study

Authors:

Mitch J Duncan, Corneel Vandelanotte, Gregory S Kolt, Richard R Rosenkranz, Cristina M Caperchione, Emma S George, Mohan Karunanithi, W Kerry Mummery

Purpose:

Many adult males are physically inactive and have poor dietary practices. Despite the potential reach and efficacy of IT-based interventions to address this issue few specifically target males. This study examines the effectiveness of a 9-month IT-based intervention to improve the physical activity and dietary behaviors of middle-aged males compared to a print-based intervention.

Methods:

Participants (males aged 35-54) were randomized into either an IT-based (web and mobile phone) or print-based intervention arm on a 2:1 basis in favour of the IT-based arm. The ManUp intervention was specifically designed to target males and included educational materials, promoted self-monitoring and goal setting. Intervention content was the same in both intervention arms, only the delivery mode differed; content could be accessed throughout the 9-month study period. Participants' physical activity and dietary behaviors were self-reported at baseline, 3 months and 9 months. Trial registration-ACTRN12611000081910.

Results:

A total of 301 participants (IT-based = 205; print-based = 96) completed baseline assessments. There were no significant between group differences ($p \geq 0.05$). Participants in both groups reported an increased number of minutes and sessions of physical activity at 3 months ($b(\text{exp})=1.45$, 95% CI=1.09-1.95; $b(\text{exp})=1.61$, 95% CI=1.17-2.22) and 9 months ($b(\text{exp})=1.55$, 95% CI=1.14-2.10; $b(\text{exp})=1.51$, 95% CI=1.15-2.00). Overall dietary behaviors improved at 3 months ($b(\text{exp})=1.07$, 95% CI=1.03-1.11) and 9 months ($b(\text{exp})=1.10$, 95% CI=1.05-1.13) in both groups.

Conclusions:

Delivery of the ManUp intervention using IT- and print-based modes was effective in improving physical activity and dietary behaviors in middle aged males with no differences between delivery modes.

O32.3**Getting people with heart disease active using mobile phones: A randomised controlled trial****Authors:**

Ralph Maddison, Leila Pfaeffli, Robyn Whittaker, Ralph Stewart, Andrew Kerr, Karen Carter, Yannan Jiang

Purpose:

To determine the effectiveness and cost-effectiveness of a mobile phone intervention to improve exercise capacity and physical activity behavior in people with cardiovascular disease (CVD). A second aim was to identify the mediating effects of the intervention.

Methods:

In this single-blind, two-arm, randomised controlled trial adults ($n=171$) with CVD were randomised to receive a mobile phone delivered intervention (HEART) plus usual care, or usual care alone. The HEART (Heart Exercise And Remote Technologies) intervention involved a theory-based personalised, automated package of text messages and a secure website with video messages aimed at increasing exercise behavior, delivered over 24 weeks. All outcomes were assessed at baseline and 24 weeks and included peak oxygen uptake (PVO₂; primary outcome), self-reported physical activity and self-efficacy (secondary outcomes).

Results:

Both groups increased PVO₂, however there were no differences between the two groups (difference -0.21 mL·kg⁻¹·min⁻¹, 95% CI: -1.1, 0.7; $p=0.65$) at 24 weeks. Significant treatment effects were observed for leisure time physical activity (difference 110.2min/week, 95% CI: -0.8, 221.3; $p=0.05$) and walking (difference 151.4 min/week, 95% CI: 27.6, 275.2; $p=0.02$). There were also significant improvements in self-efficacy to be active (difference 6.2%, 95% CI: 0.2, 12.2; $p=0.04$) at 24 weeks, and self-efficacy mediated the effect on self-reported physical activity.

Conclusions:

A mobile phone intervention was effective increasing physical activity but not for increasing exercise capacity and has potential to augment existing CVD management services. Self-efficacy mediated changes in physical activity.

O32.4

Effects and working mechanisms of a computer-tailored physical activity intervention for adults aged over fifty

Authors:

Denise Peels, Maartje van Stralen, Catherine Bolman, Hein de Vries, Rianne Golsteijn, Aart Mudde, Lilian Lechner

Purpose:

This study identifies the long-term effectiveness and the psychosocial and environmental working mechanisms of a Web-based and a printed computer-tailored physical activity (PA) intervention for adults aged over fifty years.

Methods:

Within an RCT (N=2140, including a waiting-list control group) intervention participants received 3 sets of (printed or Web-based) tailored advice over a 4 month period. Outcome measures were weekly minutes of moderate-vigorous PA (MVPA) and days with sufficient PA 1 year after the intervention started. Potential mediators (pre-motivational, motivational, post-motivational, and environmental determinants of PA) were assessed at baseline, 3 and/or 6 months later.

Results:

Intervention effects on weekly minutes of MVPA were found for the printed intervention in contrast to the control group ($B=131.00$; $p=.002$), but not for the Web-based intervention ($B=16.80$; $p=.699$). The printed intervention also resulted in increase in weekly days with sufficient PA ($B=.70$; $p<.000$), whereas the Web-based version had a borderline significant effect on weekly days with sufficient PA ($B=.25$; $p=.055$). A total of 23% of the effect of the printed intervention on both PA outcomes could be explained by the assessed mediators (i.e. awareness of sufficiency of PA, intention, and perceived quality of the environment significantly mediated the intervention effect).

Conclusions:

Tailored PA interventions would benefit from the use of strategies to enhance awareness of sufficiency of PA, intention, and perceived quality of the environment. Efforts should be made to increase the efficacy of such strategies in Web-based interventions. Strategies should be integrated to effectively target other determinants of PA.

Orals 33

Physical Environment and PA in Adults

Moderator: Kristin Meseck

Affiliation: University of California, San Diego, San Diego, CA, USA

O33.1

The impact of missing Global Positioning System (GPS) signal data on relationships between environmental variables and objectively measured physical activity and sedentary behavior

Authors:

Kristin Meseck, Marta Jankowska, Loki Natarajan, Suneeta Godbole, Jacqueline Kerr, Jordan Carlson, Jasper Schipperijn, Katie Crist

Purpose:

Explore environment-related patterns of GPS signal-loss, levels of objectively measured physical activity (PA) during periods of GPS signal loss, and the effect of missing GPS data on relationships between environmental variables, PA and sedentary behavior.

Methods:

Eight free-living studies using GPS and accelerometer devices were pooled, representing a range of participants, life-styles and built environments. Minutes of sedentary time, light intensity PA, and moderate-to-vigorous PA were assessed for each period of missing GPS signal ('lapse'). A random-effects mixed model was used to account for clustering of lapse epochs nested within days and subjects. Land use, population density, and minutes of sedentary time were modeled as fixed effects on the square-root transformed lapse length.

Results:

563 subjects with missing GPS data were assessed totaling 2,036 days. GPS lapse epochs range = 1 to 1427 min/day (mean = 176 ± 246 min.). Average daily minutes of PA during missing GPS epochs were: Sedentary = 199 ± 184 , light PA = 69 ± 81 , MVPA = 3.0 ± 9.0 . Compared to time spent in residences, mean (square-root transformed) lapse length was lower in commercial facilities (coeff(SE): -1.023 (0.187), $p < 0.001$) and in parks (-0.645 (0.319), $p = 0.045$). Sedentary time was positively associated with lapse length ($p < 0.001$), with each minute increase in sedentary time associated with 0.05 increase in (sqrt) lapse time.

Conclusions:

GPS signal loss may yield biased results in studies of participants who spend considerable time at home or have a sedentary lifestyle when relationships between sedentary time, PA and the environment are of interest.

O33.2**The effect of the physical environment and levels of physical activity on affective states****Authors:**

Florence-Emilie Kinnafick, Cecilie Thøgersen-Ntoumani

Purpose:

The physical environment and physical activity can independently improve positive affect. The current studies investigated the effects of two opposing environments (urban versus natural) and levels of activity (walking and sitting) on affective states in either a laboratory (study 1) or an outdoor setting (study 2).

Methods:

Using an experimental within subject design, 70 physically inactive participants were randomly allocated to study 1 (32 female, 8 male; BMI: $M=23.35$ kg/m², $SD = 5.1$) or study 2 (17 females, 13 males; BMI: $M= 23.11$ kg/m², $SD = 3.67$). Participants completed 4 conditions (15 minutes of walking and sitting in each environment) over 2 visits. While doing each activity, participants either watched film clips of urban or natural outdoor settings (study 1), or were naturally immersed in an urban or a natural environment (study 2). Measures of affect were administered pre, mid and post each condition. Elements of weather were entered as a covariate (study 2).

Results:

Findings highlighted the benefits of being immersed in a natural outdoor environment with physical activity being key for positive effects on energy (Study 1 and 2: $p < .05$) and positive affect (Study 1: $p < .05$). Short bouts of sedentary behavior increased state negative affect (Study 1: $p < .05$), tiredness (Study 1: $p < .05$, Study 2: $p < .01$), calmness (Study 1 $p < .05$), and decreased energy levels (Study 1 & 2: $p < .01$).

Conclusions:

Attempts by policy-makers, urban planners and public health promoters should encourage greater use of natural open space to increase physical activity levels to promote acute psychological well-being.

O33.3**Differences in walkability self-selection across life-stages and its association with transport behavior****Authors:**

Lars Breum Christiansen, Jasper Schipperijn, Jens Troelsen

Purpose:

Built environment characteristics are fundamental for transport behavior, but observed differences could be due to residential self-selection. The aim of this study was to investigate the association between built environment characteristics, life-stages, self-selection and transport behavior.

Methods:

Built environment characteristics were assessed objectively, and the IPEN walkability index, consisting of residential density, street connectivity, land-use-mix and floor-area-retail-ratio, was used to define 14 high and low walkable neighborhoods in Aarhus, Denmark (250.000 inhabitants). Transport behavior was assessed using the IPAQ questionnaire. Life-stages were categorized in three groups according to age and living with children or not. A principal factor component analysis was conducted to assess self-selection.

Results:

A total of 642 adults aged 20-65 years filled in the questionnaire. Two self-selection clusters were detected, and were unequally distributed across the life-stages. The young non-parent group was more likely to self-select on the basis of higher walkability and shorter distance to daily destinations, whereas parents and older adults without children living at home preferred the quality of schools and access to recreational facilities and green areas. In the multivariable models high neighborhood walkability was associated with less motorized transport (OR 0.34 95%CI 0.20-0.59) and more walking (OR 1.64 95%CI 1.02-2.63). Self-selection and life-stage were also associated with mode choice, and attenuated the association between walkability and transport behavior.

Conclusions:

This study supports the hypothesis that some variation in transport behavior can be explained by life-stages and self-selection, but the effect of living in a more walkable neighborhood still persists after adjusting.

O33.4

Is achieving the goal 10,000 steps per day influenced by neighborhood walkability? Czech Republic national representative study

Authors:

Josef Mitas, Jiri Nykodym, Emil Repka, Ladislav Blaha, Aleš Suchomel, Dana Feltlova, Igor Fojtik, Petr Valach

Purpose:

The purpose of this study was to find out if achieving the goal 10.000 steps per day varies for people living in neighborhood with different walkability in Czech Republic.

Methods:

Standardized NEWS-A questionnaire was used to obtain the perceived neighborhood walkability in Czech Republic regions. Pedometer YAMAX SW 700 was used to objectively measure the physical activity. Total of 7717 adult respondents participated in the study. The analyses of repeated measures was used to analyze the data in 3309 adults aged 26-55.

Results:

The results suggest that respondents living in more walkable neighborhoods indicate meeting the recommended level of 10.000 steps per day more often than those living in low walkable areas. This association was significant in females only ($p \leq .00$). Neighborhood walkability (high or low) did not influence meeting the required goal of 10.000 steps during weekend neither in males nor females. When observing the partial scores from NEWS-A questionnaire, the most important factor supporting achieving the goal in males is access to shops and facilities in neighborhood ($p \leq .03$). No other single factor influenced the meeting the goal of 10.000 steps/day. In females the types of residences within the neighborhood ($p \leq .02$) and access to shops and facilities ($p \leq .00$) neighborhood surroundings ($p \leq .01$) positively influence meeting the recommendation; no significance was found for access to services, street in neighborhood, places for walking and cycling and crime safety.

Conclusions:

Findings from this study can inform future policy and urban interventions for obesity prevention in the Czech Republic.

Orals 34

Weight Loss Interventions and Methods in Women

Moderator: Caroline Horwath

Affiliation: University of Otago, Dunedin, New Zealand

O34.1

Weight control methods in a three-year follow-up among a cohort of middle-aged women

Authors:

Sook Ling Leong, Andrew Gray, Caroline Horwath

Purpose:

Despite the increased emphasis on weight gain prevention coupled with societal pressures on women to achieve thinness, few longitudinal studies have investigated the effectiveness of women's weight control methods in terms of weight change. The objectives of the study were to determine the prevalence and effectiveness of various weight control practices aimed at intentionally losing weight or preventing weight gain among a representative sample of middle-aged women over a period of three years.

Methods:

A sample of 1601 New Zealand women aged 40-50 years randomly selected from the nationwide electoral rolls was recruited in 2009 to participate in a prospective study. At baseline, participants completed self-administered questionnaires on weight control methods. Demographic information, height and weight were collected at baseline and three years later. Multiple linear regression models were used to test the associations between weight control methods and weight change over three years.

Results:

Weight control practices most commonly used were cutting down on meal/snack size (42%) and cutting down on fats/sugars (45%), but were not associated with three-year weight loss. In the adjusted model, baseline use of 'diet pills' was significantly associated with three-year weight gain (3.2 kg, 95% CI: 0.2, 6.3, $p=0.035$).

Conclusions:

Women reported weight control practices that were consistent with public health messages, however these strategies were not associated with three-year weight loss. When considered together, this adds support to the idea that health promotion interventions should focus on encouraging sustainable eating behavioral and lifestyle changes rather than focusing on body weight.

O34.2

Using imagery to increase and maintain self-efficacy during a weight-loss intervention

Authors:

Christy Thornton, Felicia Greer, Jenelle Gilbert, Lindsay Duncan

Purpose:

Better treatments are needed to promote weight-loss. Research has shown correlations between imagery use and weight-loss behaviors, and suggests self-efficacy mediates this relationship. Yet self-efficacy declines with time during weight-loss interventions. This study examined whether an imagery intervention employing both exercise and healthy eating imagery could increase and maintain self-efficacy and weight-loss behaviors.

Methods:

Sixty-five overweight women, aged 21-65, were randomly assigned to either an imagery treatment group or a no imagery (control) group. Both groups underwent a five-month weight-loss program involving regular exercise, a reduced calorie diet, food and exercise journaling, goal setting, and group sessions focusing on nutrition education. The imagery group also practiced imagery with guided audio scripts focusing on exercise and healthy eating. Changes in body com-

position were assessed using air displacement plethysmography. Participants reported exercise minutes and days within calorie goal; a survey measured exercise and eating self-efficacy.

Results:

The treatment group experienced significantly greater increases in exercise self-efficacy ($p < .05$). Significant group by time interactions showed that the treatment group's exercise and eating self-efficacy steadily increased throughout the intervention, whereas the control group's decreased or plateaued ($p < .05$). The treatment group showed a significant correlation between imagery use and percent fat loss ($p < .05$). No significant between-group differences were found for body composition, exercise minutes, or days within calorie goal.

Conclusions:

This study supports the use of exercise and healthy eating imagery to increase and maintain self-efficacy during a weight-loss intervention. Further studies on the role of imagery in fat loss are needed.

O34.3**Exercise-related goal contents and long-term physical activity changes in previously overweight women****Authors:**

João Silva, Inês Santos, Eliana Carraça, Marlene Silva, Marta Marques, David Markland, Martyn Standage, Pedro Teixeira

Purpose:

Goal Content Theory, a sub-theory of Self-determination Theory (SDT), explores intrinsic vs. extrinsic goals for understanding motivation and well-being. This study tested the effects of an SDT-based behavior change intervention on exercise-related goals, and their association with exercise regulations and behavior in overweight women.

Methods:

A total of 221 women (age: 37.6 ± 7.0 y; BMI: 31.6 ± 4.1 kg/m²) were assigned to an intervention or control group, participated in a 1-year weight management intervention designed to increase autonomy and intrinsic motivation for physical activity and weight control. The Exercise Motives Inventory 2 (EMI-2) and the Exercise Self-Regulation Questionnaire (SRQ-E) measured exercise goals and regulations. The 7-Day Physical Activity Recall and the Lifestyle Physical Activity Index assessed moderate/vigorous (MVPA) and lifestyle physical activity (LPA). Associations and mediation effects were tested with a Structural Equation Modeling approach.

Results:

At the 3-year follow-up, significant intervention effects on intrinsic goals, autonomous regulations, and both types of PA were seen ($r > 0.18$, $p < 0.05$). Intrinsic goals predicted autonomous regulations ($r = 0.73$, $p < 0.001$), LPA ($r = 0.44$, $p < 0.001$) and MVPA ($r = 0.26$, $p < 0.05$) while extrinsic goals and controlled regulations were also significantly associated ($r = 0.47$, $p < 0.001$). Effects on autonomous regulations were mediated by intrinsic goals (effect ratio = 0.63). In turn, autonomous regulations mediated the relationship between intrinsic goals and the two types of PA (effect ratios > 0.74).

Conclusions:

Correlational and mediation analysis involving goal contents, motivation, and exercise behavior support the motivational process model proposed by SDT showing that exercise goals may act as causal predictors of subsequent motivational regulations and long-term behavior change.

O34.4

Predicting long-term weight loss maintenance in women: Post-treatment profiles based on a signal detection approach

Authors:

Inês Santos, Jutta Mata, Marlene N. Silva, Luís B. Sardinha, Pedro J. Teixeira

Purpose:

To examine behavioral and psychological predictors of 24-month weight loss maintenance in overweight women involved in a lifestyle weight control intervention.

Methods:

Participants were 154 overweight women (age: 38.7 ± 6.6 years; BMI: 29.7 ± 4.2 kg/m²) involved in a 12-month behavioral weight management intervention with a 24-month follow-up. Signal detection analyses were used to identify characteristics at the end of the intervention that best predicted 5% weight loss maintenance at 24 months post-intervention. Descriptive profiles of each identified success-group were examined.

Results:

Self-ideal body image discrepancy best differentiated the high- and low-success-group in maintaining weight loss at 24-month follow-up. Of those with low self-ideal discrepancy, 54% met the 24-month 5% weight loss maintenance criterion (vs. 23% in women with poorer body image). Among women with poorer body image, having high exercise intrinsic motivation compensated somewhat for body image (11% were successful weight loss maintainers). Only 4% of women with high discrepancy and low intrinsic motivation met this criterion. Descriptively, the most successful group showed larger weight loss (-6.0 ± 4.9 kg), exercise intrinsic motivation (62.6 ± 11.7), flexible eating restraint (6.1 ± 1.0), moderate plus vigorous physical activity (286 ± 169), eating disinhibition (6.7 ± 3.2) and quality of life (41.5 ± 9.8) at intervention's end (all $p < 0.05$), compared to the least successful group.

Conclusions:

In overweight women, improving body image and increasing exercise intrinsic motivation during treatment likely results in enhanced long-term weight loss maintenance. Developing a flexible eating restraint pattern, increasing moderate plus vigorous physical activity, and improving quality of life may also contribute to lasting weight changes.

Orals 35

Nutrition Environmental Interventions

Moderator: Allison Nihiser

Affiliation: Centers for Disease Control and Prevention, Atlanta, GA, USA

O35.1

School health guidelines to promote healthy eating and physical activity

Authors:

Allison Nihiser, Sarah Lee, Caitlin Merlo

Purpose:

To develop school-based guidelines to improve student physical activity (PA) and healthy eating behaviors.

Methods:

CDC conducted a systematic review on school-based nutrition and PA policies, practices, and programs. Scientific reports (i.e., cross-sectional, prospective and experimental studies and expert statements) were included if they described practices to improve student nutrition and PA that were based in schools or that addressed family or community involvement in schools. A codebook was developed and used to rate scientific reports on rigor, confidence in findings, efficacy, and feasibility; expert statements were rated on organization type, conflict of interest, and supporting evi-

dence. The process resulted in the inclusion of 255 scientific studies and 112 expert statements. All studies and reports were coded and categorized by each component for coordinated school health. An external review by over 50 organizations occurred.

Results:

CDC identified nine guidelines for promoting student healthy eating and PA. Seven guidelines support components of coordinated school health: Healthy and safe school environment; nutrition services; physical education and school-based PA; health education; health services and counseling, psychological and social services; family and community involvement; and school employee wellness. Two additional guidelines emerged from the evidence: Using a coordinated approach for nutrition and PA policies and practices; and professional development for school staff members. Each guideline is accompanied by a series of strategies for implementation.

Conclusions:

CDC's guidelines provide a framework for schools to address healthy eating and PA. Implementing the recommended policies and practices will make a substantial contribution to promoting healthy behaviors.

O35.2**Impacts of the Primary School Free Breakfast Initiative on socioeconomic inequalities in breakfast consumption among 9-11 year old schoolchildren in Wales****Authors:**

Graham Moore, Simon Murphy, Katherine Chaplin, Ronan Lyons, Mark Atkinson, Laurence Moore

Purpose:

Universal interventions may widen or narrow inequalities if disproportionately effective among higher or lower socioeconomic groups. This paper examines impacts of the Primary School Free Breakfast Initiative (PSFBI) in Wales on inequalities in children's dietary behaviors and cognitive functioning.

Methods:

Cluster randomised controlled trial. Approximately 4500 children completed measures of dietary behaviors and cognitive tests at baseline and 1 year follow-up. Responses were linked to Free School Meal (FSM) entitlement via the Secure Anonymised Information Linkage (SAIL) databank. Impacts on inequalities were evaluated using weighted school-level regression models with interaction terms for intervention*whole-school percentage FSM entitlement and intervention*aggregated individual FSM entitlement. Individual-level regression models included interaction terms for intervention*individual FSM entitlement.

Setting: Fifty-five intervention and 56 wait-list control primary schools.

Results:

School-level models indicate that children in intervention schools ate a greater number of healthy items for breakfast than children in control schools ($B=0.25$; 95% CI=0.07 to 0.44), with larger increases observed in more deprived schools (interaction term $B=1.76$; 95% CI=0.36 to 3.16). The interaction between intervention and household-level deprivation was not significant. Despite no main effects on breakfast skipping, a significant interaction was observed, indicating declines in breakfast skipping in more deprived schools (interaction term $B=-0.07$; 95% CI=-0.15 to -0.00) and households ($OR=0.67$; 95%CI=0.46 to 0.98). No significant influence on inequality was observed for remaining outcomes.

Conclusions:

Universal breakfast provision may reduce socioeconomic inequalities in consumption of healthy breakfast items and breakfast skipping. There was no evidence of intervention generated inequalities in any outcomes.

O35.3

Changes in children's meal orders following healthy menu modifications at a regional US restaurant chain

Authors:

Stephanie Anzman-Frasca, Peter Dolan, Megan P. Mueller, Sarah Sliwa, Kyle Washburn, Christina D. Economos

Purpose:

Children frequently consume food from restaurants, which tends to be more energy-dense than foods prepared at home. Many experts agree that it is a priority to promote healthy children's meal options in restaurant settings, but it is unclear whether children would select healthier food following healthy menu modifications.

Methods:

Orders of children's menu items were analyzed before (September 2011-March 2012) and after (September 2012-March 2013) changes were made to increase the healthfulness of children's menus across 13 locations of a regional US restaurant chain serving over 4 million customers per year. The new menu featured: 1) more children's meals that met the National Restaurant Association's Kids LiveWell (KLW) nutrition standards for calories, fat, sodium, sugar, and food groups; 2) healthy side dishes bundled with meals by default; and 3) the removal of French fries and soda (which could still be substituted at no charge).

Results:

Across the study periods, 352,192 kids' meals were ordered. Before the menu changes, 3% of meals ordered met KLW standards; afterward, 46% met the standards. Following the menu changes, French fry orders decreased from 56% to 22% of bundled side dishes, and orders of strawberries and mixed vegetables increased from 29% to 63% and 4% to 5%, respectively. Orders of sodas decreased from 33% to 28% of children's beverages, and orders of milks increased from 37% to 40%.

Conclusions:

A shift to a healthier children's menu was accompanied by healthier orders, highlighting potential ways to promote healthy choices among children in restaurant settings.

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P001

Comparison of perceptions and objectively measured PA and sedentary time in South Asian women in the U.K.

Authors:

Whitney Babakus Curry, Janice L. Thompson

Purpose:

To explore the physical activity (PA) and sedentary time (ST) experiences of South Asian (SA) women in the United Kingdom, and compare their perceived levels to objectively measured data.

Methods:

140 SA women wore an accelerometer for 7 days; descriptive and anthropometric data were collected. A sub-sample of 24 were purposively sampled based on Body Mass Index, English language fluency, and PA/ST levels, to participate in a semi-structured interview analysed using directed content analysis.

Results:

The mean age and BMI of the sub-sample was 52.8 ± 10.1 years and 28.4 ± 6.1 kg/m², respectively. Mean objectively measured moderate-to-vigorous PA (MVPA) and ST were 34.66 ± 21.52 min/day and 553.2 ± 59.4 min/day, respectively; 34.7% met PA recommendations. Primary codes identified from interviews were conceptualizations of PA as “keeping busy” or “being healthy”, of ST as being “lazy” or “resting in old age”; most perceived they were sufficiently active due to being ‘busy’ performing household activities. A comparison of perceived and objectively measured PA/ST in the sub-sample revealed that 83% (of n=6 who recalled) women were less active than they perceived, with 100% (of n=6) accurately estimating the duration but not the intensity of their PA. None were able to recall duration of ST, limiting comparisons with objective data.

Conclusions:

Results indicate that many SA women may conceptualise sufficient PA as ‘keeping busy’, with many performing sufficient duration but insufficient intensity of PA. This suggests that interventions for this group should address the conceptualizations of intensity and ‘busyness’. Self-report measures of MVPA and ST may be particularly inaccurate in this group.

P002

Motivational profiles for physical activity: The role of integrated regulation

Authors:

Paule Miquelon, Pier-Éric Chamberland, Alexandre Castonguay

Purpose:

Based on self-determination theory (Deci & Ryan, 2000), some researchers have demonstrated that integrated regulation (INR) can predict physical activity (PA) frequency (e.g., Duncan et al., 2010; Teixeira et al., 2012) and that it could be, in some circumstances, a stronger predictor of PA frequency than intrinsic motivation (IM) and identified regulation (IDR). The aim of this study was thus to verify how INR, when compared with other types of motivation, can contribute to specific motivational profiles and predict PA frequency.

Method:

A cross-sectional design was used. Participants were 1629 adults (N=1361 women) with a mean age of 34.6 years. They completed a web-based questionnaire assessing several constructs, including motivation toward PA (Markland & Tobin, 2004) and PA frequency (Godin & Shepard, 1986) over the past three months.

Results:

Results of a regression analysis show that INR was the best predictor of PA frequency over the past three months. Also, results of a cluster analysis demonstrate that participants display three distinct motivational profiles: 1) highly autonomous, 2) moderately autonomous and 3) weakly autonomous. Finally, a chi-square analysis reveals that these profiles differently predict four level of PA frequency over the past three months: less active, moderately active, active and very active.

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Conclusions:

When evaluating the motivational profile of an individual, INR appears to be an important determinant of PA behavior. These results highlight the importance of assessing INR in PA settings when one's goal is to understand until what extent motivated behavior has health implications.

P003

Consistency in exercise timing and weekly walking participation among previously sedentary women

Authors:

Elizabeth Hathaway, Michelle vanDellen, Michael Fedewa, Michael Schmidt

Purpose:

Habit formation offers an innovative technique for promoting long-term behavior change and consistency in the timing of a target behavior is thought to be important to initiating and learning a new habit. The aim of this analysis was to assess whether consistency of exercise timing was associated with overall exercise participation during an eight week walking intervention.

Methods:

Previously sedentary, pre-menopausal women (n=52, 37.6±6.2y, 84.6% Caucasian) enrolled in an eight week walking intervention to accumulate at least 150 minutes of moderate-intensity walking weekly measured continuously by Actigraph GT3x+ monitors. Women were stratified into 4 equal groups based on percentage of brisk walking bouts (≥ 20 minutes duration) performed in the participant's most common walking period (Morning, Midday, Afternoon, and Evening).

Results:

Participants performed 62.8% of their walking bouts at a consistent time of day with quartile groupings ranging from a low of 35.8-50.9% in Group 1 to a high of 74.0-96.3% in Group 4. Evenings were the most common walking period for 69.2% of women. Average walking duration differed by consistency in daily walking time but not in a dose-response manner (154.0±29.8 min, 177.9±31.5 min, 160.3±25.0 min, 174.7±36.3 min across groups 1-4, respectively; p=0.17).

Conclusions:

Consistency of exercise timing appears to have a small effect on weekly walking averages but should be further explored in studies that (a) have greater variations in walking totals and (b) do not provide financial incentives for compliance.

P004

Looking through different lenses of health: Exploring perceptions of sport and PA participation of Karen refugees resettled in Australia

Authors:

Tea O'Driscoll, Erika Borkoles, Lauren Banting, Remco Polman

Purpose:

When researching health and sport and physical activity (PA) participation with culturally and linguistically diverse populations, it is important to consider acculturation. To date there is very limited research on how acculturation impacts activity patterns in refugees. This study aimed to identify the role of cultural and psychosocial variables and the acculturation process in engaging Karen refugees in being active.

Methods:

Fourteen semi-structured interviews were conducted with Karen refugees from Burma who were either newly-arrived or recently-arrived in Australia. The interviews explored their concepts of health and variables associated with their participation in sport and PA in Burma and Australia. Research collaboration with key community leaders who also acted as interpreters was vital for the success of our research endeavours.

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Results:

We identified significant differences in how newly-arrived and recently-arrived Karen refugees in Australia perceive notions of health. We found that the role of sport and PA in maintaining good health across the lifespan was not well understood by newly-arrived refugees. These culturally different perceptions of health, differences in activity patterns and opportunities for sport participation in Burma, and acculturation processes make participation in sports and PA in Australia challenging for refugees.

Conclusions:

This research highlights the importance of considering the different interpretations of health and the role of acculturation when designing and implementing services aimed at increasing sport and PA participation for refugees. Understanding how cultural and psychosocial variables may impact sport and PA participation for Karen refugees is key to successful future interventions.

P005

Promoting PA through quality management. Healthy community round tables for regional health promotion in Bavaria, Germany

Authors:

Tobias Fleuren, Annekatrin Bütterich, Holger Hassel

Purpose:

To promote physical activity and other aspects of a healthy lifestyle the health departments of eight Bavarian administrative districts carry out a systematically community based development process for health promotion. The pilot phase runs from January 1st 2013 to December 30th 2014. Against this background the study "EVA" aims at the overall evaluation and at quality aspects and standards in the development and implementation of long-lasting community based health promotion, while taking account to the specific characteristics of each partner.

Methods:

To build up a consistent quality management, the health departments are supported by eight training sessions regarding self-evaluation using the Goal Attainment Scaling (GAS) or successful networking and six meetings of the steering committee. Additionally a peer evaluation of projects in the communities will be conducted in the last quarter of 2014. It will be based on specific quality standards for good practice interventions in Germany.

Results:

Six out of the eight associated health departments initialize good-practice projects for physical activity. Overall, there are eleven measures (e.g. healthy way to school), focused on physical activity.

Conclusions:

Through the trainings, a systematic quality management for the planning and implementation of community based health promotion will be established. Thus, sustainable projects for promoting physical activity can be realized. The results of the overall evaluation will be considered in the development of a guideline for healthy communities.

The project "Healthy Community - Round Tables for regional health promotion" is funded by the Bavarian State Ministry for Public Health.

P006

Long-term cost-effectiveness of a computer-tailored PA intervention: Consequences for disease incidences and quality of life

Authors:

Denise Peels, Rianne Golsteijn, Talitha Feenstra, Rudolf Hoogenveen, Catherine Bolman, Aart Mudde, Hein de Vries, Lilian Lechner

Purpose:

This study provides insight in the cost-effectiveness of a computer-tailored physical activity (PA) intervention in differ-

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ent conditions (i.e. print-delivered versus Web-based, and with or without an environmental approach) among adults aged over fifty years.

Methods:

Results from an RCT (in MET-hours of PA) 12 months after the start of the intervention were extrapolated to long-term outcomes (i.e. 5, 10 years and lifetime) in terms of health care costs, PA-related disease incidences and quality-adjusted life years gained (QALYs), using the computer simulation Chronic Disease Model. Incremental cost-effectiveness ratio's (ICERs) were calculated for the different intervention conditions.

Results:

The printed and the Web-based intervention both resulted in decreased incidence numbers for PA-related diseases (unto a decrease of 3%) and an increase in QALYs. When considering a Willingness-to-Pay of €20,000/QALY (as mostly used for preventive interventions), on a life-time horizon, both the printed (ICER = €7,504/QALY) as well as the Web-based intervention (ICER = €10,097/QALY) have proven to be cost-effective interventions. On a 5-year time horizon the Web-based intervention was more cost-effective than the printed intervention. On a 10-year and life-time horizon, the printed intervention was more cost effective than the Web-based intervention. Adding an environmental approach resulted in higher intervention costs and lower effects than the basic intervention, and was therefore less cost-effective than the basic tailored intervention.

Conclusions:

A tailored PA intervention in a printed delivery mode, without an environmental approach is the most cost-effective in adults aged over fifty, and thus the most feasible for large scale implementation.

P007

Associations of SES with different sedentary behaviors in Australian adults from the Social, Economic and Environmental Factors study (SEEF)

Authors:

Emmanuel Stamatakis, Anne Grunseit, Ngaire Coombs, Ding Ding, Coombs Chau, Philayrath Phongsavan, Adrian Bauman

Purpose:

Sedentary behavior (SB) is an emerging risk factor for non-communicable disease. Associations between SB and SES are poorly understood. We aimed to clarify the associations between SES and multiple SBs.

Methods:

Associations between household income, individual education level, and area-level index of occupation/education and four self-report SB indicators (total sitting time, TV-viewing, computer use, driving) were examined cross-sectionally for 60,404 Australian adults aged 48 years and older. Two level random intercept variance components linear regression models were adjusted for demographic, health, and SES covariates and stratified by employment status.

Results:

Generally, higher computer and total sitting time, and lower TV were associated with higher SES and driving exhibited a mix of significant linear, non-linear and non-significant associations. Effect sizes varied across SES indicator, SB and employment status. For example, among those employed, highest versus lowest education levels differences were +half an hour/day for computer and total sitting and -half an hour/day for TV and driving time (all $p < .001$). Corresponding differences for highest versus lowest income level were +1.3, +1.6, -.26 (all $p < .001$) and -.03 hours/day (NS). Area level SES showed few significant associations with SB, especially for unemployed respondents.

Conclusions:

SES and SB correlate differently depending on how SES is operationalised. Further, relationships observed between one SB and SES will not necessarily be replicated in a SB in a different domain. Therefore, which SES group is most at risk depends on the SB being targeted. Additionally, SES effects on SB may not be captured with a single SES measure.

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P008

Searching for pathways to advance inter-disciplinary population health research: Integrating mobile-health initiatives with active living research

Authors:

Tarun Katapally, Nazeem Muhajarine

Purpose:

Global population is predominantly inactive, yet mobile applications to increase physical activity (PA) are largely geared towards individuals who are already active. This study's objective is to design an evidence-based application specifically for the inactive population.

Methods:

In 2010, accelerometers were used to collect activity data from 455 10-14 year old children in Saskatoon, Saskatchewan, Canada (smartcitieshealthykids.com). During accelerometer deployment, height and weight were measured to determine weight status. These data were used to generate daily thresholds for sedentary behaviour (SED) similar to age-specific, World Health Organization physical activity (PA) guidelines. Utilizing these thresholds, an application was designed to optimize daily PA and SED ratio. This application has two components □ daily and monthly activity reports. Daily report gives individuals green, amber or red signals based on their daily PA and SED. Monthly report aggregates daily signals to classify individuals into green, amber and red zones.

Results:

Participants were segregated into three traffic light groups based on their mean daily PA and SED. Between these groups, significant differences in obesity prevalence were observed □ green: 2%; amber: 13%; red: 18%.

Conclusions:

Preliminary evidence generated here needs validation in a randomized trial which would provide an opportunity to obtain longitudinal digital activity data. This application would not only aid individuals to be more active and less sedentary, but also provide practitioners an evidence-based method to consult on lifestyle interventions. Policy implications revolve around incorporating mobile-health initiatives into population health research and developing strategies to ethically manage digital 'big data'.

P009

Contextual and behavioral factors for participation in high-intensity functional training

Authors:

Katie Heinrich, Sarah Stevenson, Taran Carlisle, Andrea Sweetwood

Purpose:

CrossFit™, or group-based high-intensity functional training (HIFT), is thought to address key exercise barriers-lack of time, social support, and access-and has grown 780% since 2006. This was the first study to explore contextual and behavioral factors related to HIFT participation.

Methods:

Six Midwestern HIFT gym owners (66.7% male) participated in 60-minute interviews. All were college educated and white and averaged 4±3 years coaching experience; average age was 39±8 years. Gyms were 1-11 years old and averaged 30 members (84% attended regularly). Interviews were audio-recorded, transcribed verbatim, and verified by participants. Four researchers independently read each transcript and collaboratively developed key themes. Data were thematically coded data using NVivo 10 and verified by a second coder.

Results:

Six key themes were identified: Clients, coaching, community, culture, effects/impact, and mental. Key aspects describing clients included personality factors, evangelism, focus on results, time, military, and gender. Key aspects for coaching included quality of instruction, motivating clients, scaling workouts, individual instruction, safety, and prioritizing movement quality. Key community aspects included social support, supportive atmosphere, competition, family, and camaraderie. Aspects of the culture included variety of workouts, measurable results, intensity, intimidating,

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lifestyle changes, language, clothing, and tattoos. Key effects/impacts included results, improved fitness, weight loss, learning new skills, and improving technique. Psychological aspects included achievement, goal setting, motivation, confidence, and attitude.

Conclusions:

HIFT through CrossFit™ addressed key exercise barriers. Although initially intimidating with its own culture, participants benefited from quality coaching, a supportive community, seeing results and improving self-efficacy, which affected adherence.

P010

Staying “On Beat” with high-intensity interval training: Impact of music on exercise performance and social cognitions

Authors:

Matthew Stork, Matthew Kwan, Martin Gibala, Kathleen Martin Ginis

Purpose:

To determine the psychosocial and physiological effects of listening to music during high-intensity interval training (HIT).

Methods:

Twenty moderately active adults (22 ± 4 y), unfamiliar with this form of exercise, completed an acute session of HIT under two different conditions: No music and with music. The HIT exercise task consisted of four, 30-second “all-out” bouts on a cycle ergometer, separated by four minutes of rest. Peak and mean power output, ratings of perceived exertion (RPE), affect and task motivation were measured during the exercise. Affect and perceived enjoyment of the exercise were measured immediately post-exercise and at 30 and 60 minutes post-exercise. Attitudes and intentions towards HIT were evaluated before and after all study protocols were completed. Mixed-effects modeling and paired sample t-tests were used to evaluate changes in the dependent measures over time and between the two conditions.

Results:

Peak and mean power significantly decreased over the course of the exercise trials and were found to be consistently higher in the music condition (coefficients = 49.09 [SE=13.59], 28.75 [SE=14.34], $p < 0.05$). There were no differences between conditions for RPE, affect or task motivation. Perceived enjoyment increased over time and scores were significantly higher with music (coefficient = 7.00 [SE=3.05], $p < 0.05$). Finally, attitudes and intentions towards HIT were high at baseline and did not change upon study completion.

Conclusions:

Music appears to enhance the performance and enjoyment of HIT. Additionally, moderately active individuals expressed positive attitudes and intentions towards HIT, which did not change after experiencing intense HIT exercise protocols.

P011

Steps that count! The association between daily steps and health - a pedometer-based cross-sectional study in an employed, S African population

Authors:

Julian Pillay, Tracy Kolbe-Alexander, Simone Tomaz, Karin Proper, Hidde van der Ploeg, Willem van Mechelen, Estelle Lambert

Purpose:

To determine the association between volume and intensity of daily steps and health measures in a South African employed adult group.

Methods:

A convenience sample, recruited from work-site health risk screening ($N=312$, 37 ± 9 yrs), wore a pedometer for at least 3 consecutive days. Steps were classified as “aerobic” (≥ 100 steps/minute and ≥ 10 consecutive minutes) or “non-aero-

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bic" (<100 steps/minute and/or <10 consecutive minutes). Health outcomes included blood pressure, body mass Index, percentage body fat, waist circumference, blood cholesterol and blood glucose. Analyses of co-variance (ANCOVA), adjusting for age, gender and total steps/day were used to compare groups according to volume and intensity-based steps categories. A further analysis compared the mediation effect of body fat estimates (percentage body fat, body mass index and waist circumference) independently on the association between steps and health outcomes.

Results:

Average steps/day were $6,574 \pm 3,541$; Total steps/day and average daily aerobic time were inversely associated with body fat estimates and systolic blood pressure ($p < 0.05$) in the expected direction. Of the 3 body fat measures, percentage body fat emerged as the strongest mediator of the relationship between steps and outcomes, whilst body mass index showed the least mediation effect.

Conclusions:

The interplay between volume and intensity of steps/day on health outcomes is of increased importance. Pedometer-based recommendations that incorporate volume, intensity and duration of ambulatory physical activity is therefore of particular relevance. The study provides a unique presentation of cross-sectional pedometer data that relates to a combination of intensity and volume-based steps/day and its relationship to current physical activity guidelines.

P012

Effects of pedometer-based interventions on intrinsic motivation for walking in college faculty & staff

Authors:

Jamie Mangan, Heather Starnes

Purpose:

The purpose of this pilot study was to examine whether faculty and staff at a university were more likely to achieve a 10,000 step per day goal if recording frequency of daily steps was increased from once per day to four times.

Methods:

A sample of 29 volunteers (female $n=16$, male $n=13$) from a California university, during a pre-intervention appointment, were asked to complete three days of baseline data of typical walking behavior and were randomly assigned to a control (1x/day frequency, $n=13$) or treatment group (4x/day frequency, $n=15$). A five-week intervention was conducted where participants wore pedometers and recorded step count each day. Differences between the control and treatment groups at pre- and post-intervention were evaluated using an independent t-test while changes within the respective groups from pre- to post-intervention was determined by a paired t-test.

Results:

Significant differences ($p < .05$) in change of average steps per day by week ($p = .042$) were observed in the treatment group from pre- to post-intervention when participants who were completing over 10,000 steps at baseline were excluded. There was a greater increase in average step count from baseline to week 5 in the treatment group ($+1934 \pm 2912$) than the control group ($+732 \pm 1755$) however the increase was not found to be significant ($p = .265$).

Conclusions:

Findings suggest that recording step counts more frequently in pedometer interventions may help to increase daily steps from baseline in those who are not already completing 10,000 steps a day.

P013

Engaging male university employees in an intervention targeting PA and sedentary time: Results from the ManUp UWS process eval

Authors:

Emma George, Gregory Kolt, Richard Rosenkranz, Justin Guagliano

Purpose:

The purpose of this study was to evaluate participants' perceptions of specific components and contextual factors

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associated with the effectiveness of the ManUp UWS intervention. The ManUp UWS study was a two-arm randomised controlled trial designed to increase physical activity (PA) and reduce sedentary time (ST) in middle-aged male university employees.

Methods:

A total of 47 participants (84% of sample) completed a printed process evaluation questionnaire at the end of the formal intervention (12 weeks). Participants responded to questions on intervention elements and perceived changes in PA and ST on a 5-item Likert scale, and provided written responses to open-ended questions on the appeal of intervention elements, and program enhancement.

Results:

Primarily, participants reported joining the program to increase PA (81%), to change their lifestyle (57%), and to lose weight (51%). A total of 73% of participants reported that their PA had “increased” since baseline, and 45% reported that their ST had “decreased.” Participants reported enjoying the simplicity of the intervention, and indicated that their involvement in the intervention motivated them to increase PA. Several participants reported improving non-targeted lifestyle behaviors (e.g., diet). Suggestions by participants for enhancing the program included offering discounted membership to the University gym, establishing ManUp UWS as an ongoing program, and using podcasts to deliver information.

Conclusions:

Participants responded positively to the ManUp UWS intervention and were eager to see the implementation of an ongoing PA program for staff members. These findings can be used to inform future PA interventions targeting male university employees.

P014

Knowledge of exercise prescription guidelines across a four-year kinesiology curriculum: Implications for evidence-based practice

Author:

Panteleimon Ekkekakis

Purpose:

Exercise prescription guidelines and physical activity recommendations have been developed by several governmental and scientific organizations. Moreover, numerous revisions and updates have been published over the past four decades. Knowledge of the guidelines and recommendations has been studied, and found to be low, among the public and health professionals in several countries. The present survey examined knowledge of the exercise prescription guidelines issued by the American College of Sports Medicine among students majoring in kinesiology in a large public university in the USA.

Methods:

Of approximately 1,000 students, 625 completed a paper-and-pencil, 11-item, multiple-choice survey addressing the frequency, duration, and intensity (percentages of maximal heart rate, metabolic equivalents, and ratings of perceived exertion) recommended for developing and maintaining fitness among healthy adults.

Results:

The average score was 33.1% (SD=16.0%), with a range from 0% to 81.8%. There was no difference between men (32.8%) and women (33.3%). There was a 10.7% improvement over the curriculum: 25.6% in freshmen, 29.7% in sophomores, 33.9% in juniors, and 36.3% in seniors. There was no correlation between knowledge and grade point average among seniors ($r=0.10$, $p=0.13$, $n=231$). On a scale from 0 to 10, students evaluated their knowledge as 4.8 (SD=2.2) but the knowledge required “to be able to function as an exercise professional safely and effectively” as 8.1 (SD=2.1).

Conclusions:

As kinesiology attempts to make the transition to evidence-based practice, significant curricular changes will be required. Furthermore, the role of inconsistencies between guidelines and recommendations in generating confusion should be considered.

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P015

Rates and correlates of PA among underserved minority populations: Evidence from South Carolina LGBT tobacco users

Authors:

Vahe Heboyan, Gina Besenyi, Andy Pope, Theresa Oniffrey

Purpose:

This study examined the correlation of socio-economic, demographic, and behavioral factors with PA among SC LGBT individuals.

Methods:

Data for 123 LGBT previous and current smokers were obtained in 2013 via online validated questionnaire measuring PA, tobacco use and cessation behavior, nutrition, health and weight indicators, social norming, and socio-economic and demographic factors. PA was measured via self-reported participation in moderate and vigorous physical activity (MVPA) in the last 7 days. Model 1 estimated associations between MVPA participation (yes/no) and independent variables using logistic regression. Model 2 estimated associations between weekly minutes of MVPA and independent variables using ordinary least squares.

Results:

Individuals who had children, used drugs or heavy alcohol, or were overweight were significantly less likely to indicate participation in MVPA (OR=0.09; 0.79; 0.21; 0.35). Lesbians, college students, those who had excellent health, a college degree, felt depressed, or earned over \$50,000 were significantly more likely to be engaged in MVPA (OR=3.73; 8.65; 25.95; 2.62; 2.88; 7.43). Individuals who had a higher BMI, a disability, daily vegetable consumption or were lesbian had significantly less weekly minutes of MVPA (β = -22.2; -1.5; -0.8; -1.4). In contrast, full-time employment, age (45+), and daily fruit consumption had statistically significant positive impact on weekly minutes of MVPA (β =0.6; 1.5; 0.7).

Conclusions:

Results confirm anecdotal evidence that among LGBT gays are more attentive to their physique than lesbians and give us better understanding of PA correlates among this understudied population that can be used for policy and program development to improve LGBT health.

P017

Education and income in relation to self-reported and objectively measured PA in Finnish adults

Authors:

Jaana Jaako, Jaakko Pehkonen, Mirja Hirvensalo, Xiaolin Yang, Olli Raitakari, Tuija Tammelin

Purpose:

The aim of this study was to evaluate how the socioeconomic status is related to self-reported and objectively measured physical activity in Finnish adults.

Methods:

The study sample consisted of 1910 participants, aged 34-49 years, as a part of a 31-year follow-up of the Cardiovascular Risk in Young Finns study. In 2011, the participants reported their level of education, annual income, and physical activity by questionnaire. The physical activity index (PAI), ranging from 5 to 15, was formed to illustrate self-reported physical activity. The physical activity was also measured objectively using a pedometer (Omron), and was divided into total steps/day and aerobic steps/day. Aerobic steps were calculated automatically for continuous walk for >10 min without interruption.

Results:

High level of education was directly associated with the PAI ($p=0.001$), inversely associated with the total steps ($p=0.003$), but not associated with the aerobic steps in men. In women, high level of education was directly associated with the PAI ($p=0.002$) and aerobic steps ($p=0.012$), but not with the total steps. In addition, income was directly as-

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sociated with the PAI ($p<0.001$) and inversely associated with the total steps ($p=0.003$) in men, but not associated with the aerobic steps. In women, income was directly associated with the PAI ($p=0.002$) and aerobic steps ($p=0.003$), but not with the total steps.

Conclusions:

These preliminary findings indicate that education and income are both associated with physical activity. However, the results seem to vary between men and women and depend on the method used to measure physical activity.

P018

Which behavior change techniques are associated w/ long-term effectiveness of PA interventions in adults aged 55-70 yrs?

Authors:

Nicola Hobbs, Suzanne McDonald, Vera Araújo-Soares, John Mathers, Thomas Meyer, Lynn Rochester, Martin White, Falko Sniehotta

Purpose:

Retirement offers a window of opportunity to intervene to promote physical activity (PA). PA interventions and their effects are heterogeneous, and there is a need to identify features of interventions (content and delivery) which are related to long-term effectiveness.

Methods:

In this systematic review, randomised controlled trials of interventions to promote PA in healthy or 'at risk' adults (mean/median 55-70 years) that assessed PA ≥ 12 months after randomisation were included. The behavior change techniques (BCTs) and modes of delivery of the interventions were coded by two reviewers independently. Meta-analysis and meta-regression were conducted. Narrative moderator analyses were guided by incidence and concurrence matrices.

Results:

Nineteen trials were meta-analysed to assess the effectiveness of interventions to promote PA when compared to a no/minimal intervention comparator ($d = 0.29$, 95% CI=0.19 to 0.40). Data from 12 month ($n=14$), 18 month ($n=2$), 24 month ($n=2$) and 36 month ($n=1$) follow-up time points were used. The number of BCTs used in an intervention (mean=9) did not relate to the effect size. Goal setting was the most commonly used BCT and frequently co-occurred with self-monitoring, follow-up prompts, graded tasks and barrier identification. At least five of the seven most effective interventions ($d \geq 0.40$) used self-regulatory BCTs of goal setting, self-monitoring, graded tasks and feedback.

Conclusions:

Interventions in adults aged 55 to 70 years can produce long-term improvements in PA. The most successful interventions used BCTs aligned with self-regulation theory. Interventions aiming to promote long-term PA improvements in the retirement transition should consider using these components.

P019

Perceptions of PA among working mothers & fathers: A qualitative study

Authors:

Emily Mailey, Jennifer Huberty, Danae Dinkel

Purpose:

The transition to parenthood is consistently associated with declines in physical activity. In particular, working parents report numerous physical activity barriers (e.g., lack of time, guilt) and are at risk for inactivity. Despite these trends, interventions targeting working mothers have been scarce, and physical activity barriers and facilitators among working fathers have not been explored. The purpose of this study was to qualitatively examine perceptions of physical activity among working parents.

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Methods:

Working mothers (n=13) and fathers (n=12) were recruited to participate in one of four focus group sessions and discuss physical activity barriers and facilitators. Data were analyzed using immersion/crystallization in NVivo 10.

Results:

Major themes for barriers in both moms and dads included family responsibilities, guilt, lack of support, scheduling difficulties, and work. Major themes for facilitators included being active with kids or during kids' activities, making time/prioritizing, motivation to improve health, and support. Several gender differences emerged within each theme, but overall both mothers and fathers reported their priorities had shifted to focus on family after becoming parents, and those who were fitting in physical activity had developed strategies that allowed them to balance their household and occupational responsibilities.

Conclusions:

The results of this study suggest working mothers and fathers have similar perceptions of physical activity and would benefit from interventions that teach strategies for overcoming barriers and prioritizing physical activity amidst the demands of parenthood. Future interventions might consider targeting mothers and fathers in tandem to create an optimally supportive environment in the home.

P020

Messages to promote PA: Are descriptors of required duration and intensity related to intentions to be more active?

Authors:

Emily Knox, Ian Taylor, Stuart Biddle, Oliver Webb, Lauren Sherar

Purpose:

Mass-media health campaigns promote recommendations that adults should achieve at least 150 minutes/week of moderate-to-vigorous physical activity (MVPA). We investigated the association between messages which differently described the intensity and duration of MVPA guidelines, and intentions to engage in more MVPA. We further investigated whether this relationship was mediated by theory of planned behavior (TPB) constructs.

Methods:

UK adults completed an online survey in February and March 2013. Participants received one of three messages: A walking message either with or without the 150 minute/week threshold (WalkT; WalkNT); a physiological description of MVPA with the 150 minute/week threshold (PhysT). Questions relating to TPB constructs assessed intention, subjective norms, perceived behavioral control (PBC), attitudes, and self-efficacy. ANCOVA examined group differences in intention and path analysis evaluated mediation by TPB variables.

Results:

Of the 1412 adults completing the survey, 70% were female, 93% white and 23% reported meeting MVPA guidelines. ANCOVA identified that participants receiving the PhysT message had lower intentions to increase their MVPA than WalkT and WalkNT ($p < .001$). Path analysis identified a significant indirect relationship between WalkT and intentions via PBC ($\beta = .014$, 95% CI = .004 to .028), and between WalkNT and intentions via affective attitudes ($\beta = .059$, 95% CI = .006 to .113).

Conclusions:

Messages which exemplify MVPA through walking are associated with higher intentions to increase MVPA than messages using a physiological description. In addition, the 150 minute/week threshold is not associated with reduced intentions when paired with walking. Messaging campaigns should target PBC and affective attitudes and investigate further other MVPA exemplars.

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P021

Relationships between PA, sedentary behavior, and subjective well-being in Latinas as a function of measurement method

Authors:

Kevin Moran, Simon Marshall, Thomas L. McKenzie, Ming Ji, John Elder

Purpose:

To examine (1) associations between objectively measured physical activity (PA) and Subjective Wellbeing (SWB), (2) associations between objectively measured Sedentary Behavior (SB) and SWB; and (3) whether the relationship of PA and SB with SWB varies by PA or SB measurement method (objective vs. self-report).

Methods:

146 adult Latinas recruited to a PA intervention (mean age = 39 ± 10.6 yr; mean BMI = 30.5 ± 6.4) wore an ActiGraph GT3X+ accelerometer for 7 days and completed the WHO-5 Well-Being Index as a measure of SWB (scores range from 0-25). Moderate-to-vigorous-PA (MVPA) and SB were also measured by self-report. Hierarchical multiple regression was used to analyze the associations between MVPA, SB, and SWB, adjusting for age, BMI, and income.

Results:

Mean SWB score was 16.96 ± 4.95 . Participants engaged in a mean of 200.47 ± 139.43 min/wk of MVPA, and 54.33 ± 10.53 hours/wk of SB based on accelerometry. Participants self-reported 1114.55 ± 1480.31 min/wk of MVPA, and 40.39 ± 27.80 hr/wk of SB. SWB was not significantly associated with objectively measured MVPA ($p=.10$), objectively measured SB ($p=.84$), or self-reported PA ($p=.31$). However, self-reported SB was a significant predictor of SWB ($B = -.227$, $p = .004$).

Conclusions:

The relationship between SB and SWB appears to depend on SB measurement method, possibly due to conceptual overlap between perceived SB and a lack of positive elements in one's life. Null findings between PA and SWB may be due to selection biases associated with the active nature of participants recruited to a PA intervention.

P022

Self-efficacy for changing PA and sitting-time behaviors simultaneously

Authors:

Camille Short, Amanda Rebar, Corneel Vandelanotte, Mitch Duncan

Purpose:

To explore self-efficacy for changing multiple activity-related behaviors simultaneously.

Methods:

Self-efficacy was assessed using three items in a phone-administered survey. Participants ($n = 1,293$) rated (0-10) how certain they are that they can successfully complete a 12-week program aiming to change physical activity and sitting time individually or in combination. A regression analysis was conducted examining predictors of changing both behaviors combined.

Results:

Self-efficacy was highest for changing physical activity ($M=7.61$, $SD=2.93$), followed by changing both behaviours ($M=6.88$, $SD=2.89$), and lowest for changing sitting-time ($M=6.53$, $SD=3.24$). Significant main effects were observed for physical activity & sitting-time self-efficacy and physical activity behaviour, but not for sitting-time. A significant interaction effect for sitting and physical activity behaviours was found showing that sitting-time and self-efficacy for multiple behaviour change was positively related for low active people ($0.5 SD < M$: $b=0.02$, $SE = 0.01$, $p < .01$), but negatively related for high active people ($0.5 SD > M$: $b=-0.02$, $SE = 0.01$, $p=.02$).

Conclusions:

These findings suggest that self-efficacy for changing both behaviors simultaneously is predicted by self-efficacy for changing each behavior individually, and is especially high among those exhibiting both risk behaviors (those with high

sitting and low activity). It also suggests that 'active couch potatoes' (those with high sitting and high activity) are likely to have lower self-efficacy for completing such a program. These findings will be useful for guiding the development of interventions targeting these behaviors in combination.

P023

Social and physical environment correlates of adults' weekend sitting time and moderating effects of physical health and retirement status

Authors:

Veerle Van Holle, Sarah McNaughton, Megan Teychenne, Anna Timperio, Delfien Van Dyck, Ilse De Bourdeaudhuij, Jo Salmon

Purpose:

This study aimed to identify social and physical environmental correlates of overall weekend day sitting in adults at or approaching retirement age (55-65y). Furthermore, the moderating effects of perceived physical health and retirement status were studied.

Methods:

Baseline data from the Wellbeing, Eating and Exercise for a Long Life study on 3,050 adults (55-65y) living in Victoria, Australia were analysed. Participants provided self-report data on social support discouraging sitting; social participation; descriptive norms; social trust and cohesion; personal safety; aesthetics; destinations; and the number of televisions in their household. Working status and physical health were also reported. MLwiN analyses examined associations between all predictors and weekend day sitting. Moderating effects of retirement status and perceived physical health, respectively, were also investigated.

Results:

In the multivariable model, only social support from family to discourage sitting was positively associated ($\beta=1.39$; $p<0.001$) and social participation was inversely associated ($\beta=-0.04$; $p=0.01$) with overall weekend day sitting. Neither physical health, nor retirement status moderated the relationship between any of the independent variables and weekend day sitting.

Conclusions:

Results from the present study suggest the importance of social factors in relation to sitting time on weekend days among adults at or approaching retirement age. Health promotion initiatives should therefore pay special attention to enhancing social interaction opportunities.

P024

Does the company of a dog influence affective response to exercise? An ecological momentary assessment study

Authors:

Yue Liao, Genevieve Dunton

Purpose:

There is increasing evidence that dog owners are more physically active than non-owners. However, little is known about how frequently dog owners actually exercise with their dogs and whether the company of a dog influences affective response to exercise. The current study aims to address these questions using a real-time capture strategy - Ecological Momentary Assessment (EMA).

Methods:

Electronic EMA surveys were delivered by mobile phones at random intervals up to 8 times each day for 12 days among 117 adults. Each EMA survey asked respondents to report their current activity type (e.g., physical activity/exercise, watching TV), affective and physical feeling states, and whether they are with their dogs. Analyses only included participants ($N=71$, 76% female, mean age=40.2) who reported being with a dog at least once during the assessment period. Multilevel models were fitted to control clustering within individuals.

Results:

Of all the EMA responses ($n=9,436$), 6.77% ($n=639$) reported being with a dog. The company of a dog did not increase the likelihood of exercising versus sedentary activity at any given EMA prompt. When with a dog, participants reported more positive affect when exercising than when being sedentary ($p<.01$). However, when not with a dog, positive affect did not differ between exercise and sedentary activity.

Conclusions:

Although dog owners were not more physically active when with a dog, they had a better mood state when exercising with a dog. Future interventions could encourage dog owners to exercise with their dogs to receive greater mental health benefits.

P025

Relationship between time spent outdoors from objective image data and overall PA time and intensity

Authors:

Katie Crist, Jacqueline Kerr, Simon Marshall, Shahrokh Golshan, Suneeta Godbole, Lu Wang, Eileen Johnson, Jasper Schipperijn

Purpose:

To investigate whether time spent outdoors measured objectively by a person wearing a camera is positively related to objectively measured physical activity (PA) time and intensity in adults.

Methods:

Adults ($N=62$, 21-82 years old) wore an ActiGraph accelerometer and Sensecam for 1 to 8 days. Sensecam images were annotated for indoor or outdoor location. Accelerometer counts per minute (CPM) and Sensecam image data were aggregated to the minute level. Average daily total PA time was computed as minutes spent at >100 CPM and moderate to vigorous PA (MVPA) as minutes spent at >2020 CPM. A linear regression model tested the relationship between time spent outdoors and total PA time. Repeated Measures Analysis of Covariance assessed differences in percentage of MVPA obtained indoors versus outdoors. Log transformed variables were used for analyses to account for non-normal distribution.

Results:

Participants spent an average of 385 ($SD=138$) and 75 ($SD=55$) minutes indoors and outdoors per day, with a total of 104 ($SD=47$) and 51 ($SD=34$) minutes of indoor PA and outdoor PA, respectively. A one hour increase in outdoor time was associated with a 23 minute increase in PA time ($p < 0.001$). 68% ($SD=29$) of all MVPA was obtained while outdoors compared to 32% ($SD=29$) when indoors, which was significantly different after adjusting for wear time, age and BMI ($F=16.46$, $p < 0.01$).

Conclusions:

Being outdoors may encourage physical activity and a greater amount of outdoor PA may reach moderate to vigorous intensities.

P026

The effects of exercise habits and sedentary behaviors on food cravings in healthy adults

Authors:

Clemens Drenowatz, Robin P. Shook, Gregory A. Hand, James R. Hebert, Stephanie Burgess, Steven N. Blair

Purpose:

Food cravings have been suggested to play a central role in the development of overweight and obesity, which is characterized by an imbalance between energy expenditure and energy intake. While exercise has been shown to affect appetite there is limited information on the effect of exercise on hedonic processes that regulate eating behavior. The purpose of this study was to explore the association between food cravings and exercise habits or sedentary behaviors.

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Methods:

Food cravings were assessed in 371 young (49.6% male; age 27.6 ± 3.8 years) adults via questionnaire. Self-reported time spent in specific exercises was dichotomized into high and low participation in endurance, strength and group exercises. Similarly, groups for high and low amounts of sitting, watching TV, and computer use were established.

Results:

High participation in strength exercise was associated with less frequent cravings for savory foods [$F(1, 362)=6.00$, $p=0.02$] and participation in high endurance exercise was associated with more frequent cravings for chocolate [$F(1, 362)=6.30$, $p=0.01$] and other sweet foods [$F(1, 362)=4.24$, $p=0.04$]. Women with high computer time reported more frequent cravings for chocolate [$F(1, 173)=5.34$, $p=0.02$], greater difficulty to resist food cravings [$F(1, 173)=5.12$, $p=0.03$], and more frequent responses to food cravings [$F(1, 173)=4.03$, $p=0.05$].

Conclusions:

In these cross-sectional analyses, endurance exercise was associated with more frequent food cravings while strength exercise was associated with less frequent food cravings. Increased food cravings with high sedentary behaviors may disrupt homeostatic mechanisms and increase relative energy intake, leading to weight gain.

P027

Is positive or negative valence of outcome expectations the more influential determinant of exercise attitudes, intentions, and behavior?

Authors:

Anne-Marie Selzler, Wendy Rodgers

Purpose:

Positive and negative expectations of behavior (beliefs) can be construed as antecedents of attitudes, but the effect of expectation valence has rarely been examined. This study aimed to determine the predictive paths among exercise expectation valence, attitudes, intentions, and behavior.

Methods:

100 (60 female, 40 male) sedentary middle aged adults completed assessments of the positivity and negativity of outcome expectations, instrumental and affective attitudes, intentions, and the leisure time exercise questionnaire (LTEQ) at baseline, 7, 12, 24 weeks of an exercise program. A series of hierarchical regressions determined the prospective paths among study variables.

Results:

At baseline, positive expectations significantly predicted instrumental attitudes ($\beta = .36$), and instrumental and affective attitudes significantly predicted intentions (β 's = .21 and .38). At 7 weeks, positive expectations significantly predicted instrumental and affective attitudes (β 's = .45 and .33), and intentions ($\beta = .52$). Negative expectations directly predicted intentions ($\beta = -.31$), and affective attitudes significantly predicted intentions ($\beta = .28$), although this was attenuated by instrumental attitudes. At 12 weeks, positive expectations significantly predicted instrumental attitudes ($\beta = .35$), and affective attitudes mediated the relationship between positive expectations and intentions. Negative expectations directly predicted intentions ($\beta = -.25$). No variables significantly predicted the LTEQ.

Conclusions:

Positive outcome expectations may be more influential determinants of attitudes than negative outcome expectations, which might directly influence behavior. Future research should include larger samples to allow for more complex modeling of the direct effects of outcome expectation valence on intentions as well as indirect effects through attitudes.

P028

Considerable lack of knowledge of PA guidelines: Implications for better targeted health promotion

Authors:

Ruth F. Hunter, Mark A. Tully, Paul Donnelly, Michael Stevenson, Frank Kee

Purpose:

Knowledge of public health guidelines is an important pre-cursor to behavior change. The purpose of this study is to investigate the correlates of knowledge of the UK physical activity (PA) guidelines.

Methods:

A Northern Ireland-wide population survey of n=4653 adults provided cross-sectional data on PA, knowledge of guidelines and socio-demographic characteristics. Multinomial logistic regression was used to investigate the associations between knowledge and PA levels (Model 1); socio-demographic characteristics (e.g. age, socio-economic position, employment, education) (Model 2); and modifiable health behaviors (e.g. smoking, alcohol, diet, PA) (Model 3).

Results:

Only 8.4% of the population reported accurate knowledge of the PA guidelines. Males who had a lower level of education (OR 5.91; 95% CI 1.67, 20.94; $p=0.006$), lived in more deprived areas (OR 4.80; 95% CI 1.87, 12.30; $p=0.001$), low income (OR 2.36; 95% CI 1.63, 3.41; $p<0.00$) and did no PA (OR 2.74; 95% CI 1.31, 5.76; $p=0.008$) were more likely to be unaware of the guidelines. Further, females who were younger (OR 1.03; 95% CI 0.02, 1.05; $p<0.00$) and reported poor health (OR 2.71; 95% CI 1.61, 4.58; $p<0.00$) were more likely to be unaware of the guidelines.

Conclusions:

There is a considerable ignorance about the levels of PA needed to promote health. An understanding of the characteristics of those who are unaware of the guidelines has important implications for the design of targeted, effective health promotion. Knowledge alone is not enough to change behavior, but it can motivate, and provides an important pre-cursor to PA behavior change.

P029

How motivation toward PA reduces symptoms in type 2 diabetes: The moderating effect of decisional balance

Authors:

Alexandre Castonguay, Pier-Éric Chamberland, Paule Miquelon

Purpose:

Physical activity (PA) is an efficient way to control type 2 diabetes (t2Db) (Colberg, 2010), and autonomous motivation (AM) has been shown to predict its practice among patients with this condition (Sweet et al., 2009). Perceived advantages and drawbacks (i.e. decisional balance, Prochaska & Diclemente, 1983) may aid or hinder this effect, but evidence remains limited, as only mediation effects (Pinto et al., 2001) have been reported. This study aims to document the conditional process under which decisional balance moderates AM effects on t2Db symptoms through the practice of PA.

Methods:

A cross-sectional design was used and participants were 493 adults with t2Db (N = 241 women, mean age = 63; S.E. = 8.8). A moderated mediation analysis with bootstrapping based on Preacher & Hayes (2008) procedure was conducted where decisional balance toward PA (Nigg, Rossi, Norman & Benisovich, 1998) moderated AM (Markland & Tobin, 2004) effects on PA frequency, which in turn mediated AM effects on t2Db symptoms.

Results:

AM indirectly and negatively predicted t2Db symptoms through PA frequency (R^2_{med} effect size = .034, boot. C.I. = -.835 - -.040), and its effects on PA frequency were significantly stronger when decisional balance had higher positive values ($p = .022$).

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Conclusions:

Taken altogether, results suggest that AM effects on t2Db symptoms through PA frequency depend on decisional balance. Further studies should investigate longitudinally whether this conditional process originates from self-regulation rather than attitudinal factors, in regard to actual t2Db-specific obstacles.

P030

Physical activity and sedentary time associated with learning outcomes in adult distance learners

Authors:

Jérôme Gijssels, Renate De Groot, Paul A. Kirschner

Purpose:

Research on physical activity and sedentary time with regard to learning outcomes focuses on children and adolescents mainly, while this relationship in adults is unclear. We investigated this relationship.

Methods:

An observational cross-sectional design was used. Starting Open University (NL) students were invited to participate (N=4945), of which 2037 participated (41.19%). Independent factors were measured using an online survey and learning outcomes were measured via the exam registration system of the university.

Results:

A multiple linear regression model was made with the covariates expected study hours, sex, age, educational level, mother tongue, study motive, and body mass index (model A) after which physical activity and sedentary time were added separately (model B and C, respectively) and then together (model D). Model B showed physical activity, contrary to the hypothesis, to be negatively related to study progress. Model C showed sedentary time, contrary to the hypothesis, to be positively related to study progress. Time spent on physical activity could detract from time spent on learning, as it is likely that spare time is limited. Possibly, time spent learning adds to the time spent sitting, as it is highly likely that most students sit down while studying. Model D showed both factors to explain unique variance, indicating they are independent.

Conclusions:

Physical activity and sedentary time in this specific group shows reversed relations with learning outcomes, in contrast to findings in children and adolescents. This could mean age plays an important role in these relationships, however more research is warranted to elaborate on this.

P031

Prediction of physical activity maintenance: A comparison between theory of planned behavior, social cognitive theory, and physical activity maintenance theory

Authors:

Darko Jekauc, Manuel Voelkle, Matthias Wagner, Filip Mess, Miriam Rainer, Britta Renner

Purpose:

In the processes of physical activity (PA) maintenance specific predictors are efficacious, which differ from other stages of PA development. Recently, Physical Activity Maintenance Theory (PAMT) was specifically developed for prediction of PA maintenance. The aim of the present study was to evaluate the predictive power of the PAMT and to compare it with the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT). Participation rate in a fitness studio was observed for 101 college students (53 female) over 20 weeks using a magnetic card. In order to predict regularity and amount of participation TPB, SCT and PAMT were used. A latent class zero-inflated Poisson growth curve analysis identified two participation patterns: Regular attendees and intermittent exercisers. SCT showed the highest predictive power followed by PAMT and TPB. Impeding aspects as life stress and barriers were the strongest predictors, suggesting that overcoming barriers might be an important aspect for exercise maintenance. Self-efficacy, perceived behavioral control, and social support could also significantly differentiate between the participation patterns.

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P032

Associations of muscular fitness with cardiovascular risk factors in young men. A national survey

Authors:

Robinson Ramírez-Vélez, Héctor Reynaldo Triana-Reina, Hugo Alejandro Carrillo, Jeison Alexander Ramos-Sepúlveda, Fernando Rubio, María Victoria Gómez, Yisel Carolina Estrada, Katherine González-Ruiz

Purpose:

Inverse associations with muscular fitness and prevalence of cardiovascular disease (CVD) have previously been reported in cross sectional studies. However, this association has not been reported in Latin-American population. The aim was to study the associations of muscular fitness with cardiovascular risk factors in young men.

Methods:

Muscular fitness by isometric handgrip (dynamometer), was measured. Outcomes included cardiovascular risk factors (body mass index, body adiposity index, waist circumference, hip circumference and blood pressure) were measured in 2,374 young men (age 21 ± 0.8 years, BMI 22.5 ± 3.6 kg•m⁻¹). All subjects were from Bogota, Cali, Medellin y Boyacá (Colombia) and belong to different universities (public and private). Multinomial logistic regression was used to study the associations of muscular fitness with cardiovascular risk factors using models with different combinations of covariates.

Results:

After adjustment for body mass index and age, the muscular fitness was inversely associated with blood pressure, body adiposity index and waist circumference ($\beta = -0.013$ to -0.365 , $P < 0.001$).

Conclusions:

This cross-sectional study demonstrated that in young men muscular fitness were associated with cardiovascular risk factors. Among youth, low muscular fitness levels should be avoided for primary CVD prevention.

P033

Food for health: An investigation of breastfeeding practices and perceived breastfeeding-related barriers and facilitators

Authors:

Shauna Burke, Jessica Smith, Anita Cramp

Purpose:

Exclusive breastfeeding is associated with important health benefits for both mother and child, and is recommended for the first 6 months of an infant's life (WHO, 2012). In Canada, only 26% of women who initiate breastfeeding report exclusive breastfeeding at 6 months postpartum (Statistics Canada, 2010). The purpose of this study was to examine and identify, using a prospective survey-based design, the breastfeeding practices (i.e., initiation and exclusivity) and perceived barriers and facilitators of healthy primiparous women in London, Canada.

Methods:

Mothers of healthy, full-term singleton infants were recruited at community clinics and via printed advertisements and social networking. Electronic surveys were completed by mothers when infants were: (a) < 4 weeks of age; (b) 3 months of age; and (c) 6 months of age.

Results:

Seventy-one women (Mage = 30.0, SD = 4.3) completed the surveys. Ninety-nine percent of women reported breastfeeding their infant at birth. Exclusive breastfeeding rates were 52% at 4 weeks postpartum, 42% at 3 months postpartum, and 14% at 6 months postpartum. The most commonly reported barrier at 4 weeks postpartum was difficulties with latching. Insufficient milk supply was the most frequently cited barrier at 3 and 6 months postpartum. Local "Well Baby" clinics were identified most often as a source of support at 4 weeks and 3 months postpartum; at 6 months postpartum family support was most commonly cited.

Conclusions:

Long-term breastfeeding adherence is a serious and multifaceted issue. Results will be discussed with regard to pre- and postnatal breastfeeding-related education and resources.

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P034

Barriers to physical activity during pregnancy: A qualitative study investigating first time mother's views and experiences

Authors:

Megan Connelly, Megan Teychenne, Helen Brown, Paige Van Der Pligt

Purpose:

Physical activity (PA) confers specific benefits during pregnancy, including a reduction in risk of pre-eclampsia, excessive weight gain and gestational diabetes. However, women in general are less likely than men to meet the physical activity guidelines and further declines are apparent during pregnancy. Reasons for the low PA participation levels in this population group are not well understood. The aim of this study was to identify the barriers perceived by women, preventing them from undertaking leisure time PA during pregnancy.

Methods:

Qualitative analyses were performed on baseline data collected in the Melbourne Infant Extend project. The self-report survey included an open-ended question regarding perceived barriers to leisure-time PA during pregnancy. Data was collected from 133 participants at ~3 months postpartum. Thematic analyses were conducted to identify key themes.

Results:

Seven key themes emerged as barriers to PA during pregnancy. These included work, tiredness, pregnancy related symptoms, active but not meeting the guidelines, lack of motivation, non-pregnancy related health conditions and a lack of knowledge. Work-related barriers were the most commonly cited reasons for lack of leisure time PA during pregnancy, a majority reported this due to lack of time because of work commitments.

Conclusions:

These findings will help inform future intervention strategies to increase PA during pregnancy. Strategies may focus on workplace physical activity promotion and time management plans, along with practices within the workplace that allow and encourage women to achieve adequate PA levels during pregnancy. Optimal PA levels during pregnancy will help support best maternal health outcomes.

P035

Prospective associations between appetitive traits at 3 months and 12 months to body mass indices infants in the first 2 years of life

Authors:

Phaik Ling Quah, Yiong Huak Chan, Izzuddin Bin Mohd Aris, Wei Wei Pang, Mya Thway Tint, Birit Broekman, Yung Seng Lee, Mary Fong Fong Chong

Purpose:

Early childhood appetite traits such as food responsiveness and slowness in eating assessed using the Child Eating Behavior Questionnaire (CEBQ) have been associated with the child's body mass index (BMI) at later ages. Few studies have examined appetitive traits in infancy in relation to BMI in the first 2 years of life.

Methods:

The Baby Eating Behavior Questionnaire (BEBQ) and CEBQ were administered to mothers from the Singapore GUSTO birth cohort study when their offspring were aged 3 and 12 months, respectively (n=458). Height and weight were measured at ages 3, 6, 9, 12, 15, 18 and 24 months, and BMI z-scores calculated. The associations of food responsiveness and slowness in eating with BMI z-scores were evaluated using multivariate linear regression.

Results:

Higher food responsiveness at age 3 months was associated with greater BMI z-scores at 6, 9, 12, 15 and 24 months of age ($p < 0.05$), while greater slowness in eating at 3 months was associated with lower BMI z-scores at 6, 12, 15 and 18 months ($p < 0.05$). Food responsiveness at 12 months was associated with BMI z-scores at 12 and 15 months but no associations were seen with BMI at 18 and 24 months. There were no associations between slowness in eating at 12 months and BMI.

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Conclusions:

Early assessment of appetitive traits in infancy at 3 months is a better predictor of childhood BMI than appetitive traits assessed at 12 months as traits at early age may be less influenced by environmental factors.

P036

Food taboo behavior among pregnant women in Tengger Tribe, Indonesia

Authors:

Lini Anisfatus Sholihah, Ratu Ayu Dewi Sartika

Purpose:

Pregnant women are one of the groups with undernutrition risk because of food taboo practice. Food taboos still exist in the community with strong culture. This research has been performed on April 2013 and aimed to explain the food taboo behavior among the pregnant women of Tengger tribe who live in Ngadas, Malang, Indonesia. Tengger people is known as the tribal community related to Bromo Mount (Holy Mount among Hindunese) and still have strong culture.

Methods:

Study design used in this research is descriptive qualitative by Focus Group Discussion with pregnant women and indepth interview with elders, family, and health care workers.

Results:

The result shows that pregnant women still obey the abdicated intergeneration food taboos. Predisposing factors are knowledge, belief, value, and attitude. Pregnant women, family, kader, and elders have positive attitudes toward food taboo while midwife has negative and covert attitudes. Food taboos are based on the belief that by avoiding the food, mother and fetus can be saved from certain dangers and also teach the value of not killing the living creatures. Enabling factors consist of utterance as the information access of food taboo and limitation of Posyandu.

Conclusions:

Reinforcing factors include the influence of parents, mother in law, husband, paraji, neighbor, and midwife. The midwife should give information to family, paraji, and pregnant woman about the food taboo.

P037

Adherence to an exercise program in obese pregnant women and improved perinatal outcomes: Fiction or reality?

Authors:

Michèle Bisson, Natalie Alméras, Sébastien Dufresne, Caroline Rhéaume, Emmanuel Bujold, Jérôme Frenette, Angelo Tremblay, Isabelle Marc

Purpose:

Inactivity may contribute to adverse perinatal outcomes in obese pregnant women. However, feasibility and effectiveness of an exercise intervention in this population remain unknown. To evaluate the effects of an exercise program on perinatal outcomes in obese pregnant women.

Methods:

Pregnant women ($BMI \geq 30$ kg/m²) were randomly assigned at 15 weeks to a 12-week personalized exercise program (3 x 1h session of moderate intensity aerobic and muscular exercise supervised by a kinesiologist) or a control group. Cardiorespiratory (VO₂AT) and muscular fitness, anthropometry, accelerometry and nutritional outcomes were assessed. Perinatal outcomes were collected from maternal charts.

Results:

Four women (3 controls, 1 exercising) out of 37 withdrew from the study. Adherence to the exercise program was 51.1±28.9% (n=18). At the end of the intervention, exercising women maintained fitness whereas controls deteriorated (ΔVO_2AT -0.6±14.1% vs -11.6±8.1% for exercise and control, respectively, p=0.019) and gained less weight (0.3±0.1 kg/wk vs 0.5±0.2 kg/wk for exercise and control, respectively, p=0.047). 3 exercising and 6 control women developed either gestational diabetes or hypertension. Birth weight and gestational age at delivery were comparable between

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groups (3587 ± 459 g vs 3387 ± 409 g for exercising and control groups respectively, and $39 \frac{3}{7} \pm 1 \frac{1}{7}$ weeks for both groups). The exercising group tended to have a higher birth weight Z-score as compared to controls (0.457 ± 0.844 vs -0.134 ± 0.932 , $p=0.065$).

Conclusions:

Exercise training is effective in maintaining maternal fitness and limiting gestational weight gain in obese, pregnant women. Larger trials are needed to determine the benefits of maternal exercise on child's health.

P038

Fruit and vegetable intake across the perinatal period: Are women meeting the guidelines and how does practitioner advice regarding healthy eating influence intake?

Authors:

Paige van der Pligt, Kylie Hesketh, Megan Teychenne, Karen Campbell, David Crawford, Kylie Ball

Purpose:

Adequate fruit and vegetable (F&V) intake across the perinatal period is vital in promoting optimal maternal health. Little is known about patterns of F&V intake during and following pregnancy and how optimal intake might be achieved. The aim of this study was to document women's F&V intake across the perinatal period, and assess associations between provision of healthy eating advice with F&V intake in first-time mothers.

Methods:

Women ($n=448$) enrolled in the Melbourne InFANT Extend study completed a cross-sectional questionnaire at ~3 months postpartum. The validated Cancer Council of Australia's Food Frequency Questionnaire assessed F&V intake over the past 12 months. Three self-reported survey items assessed general healthy eating advice provided by antenatal clinicians, pre-pregnancy, during pregnancy and postpartum. Chi square tests assessed associations between advice and meeting the Australian dietary guidelines for F&V intake (2 serves fruit/5 serves vegetables per day).

Results:

Overall 59.9% of women received healthy eating advice pre-pregnancy, 87.1% received advice during pregnancy and 47.5% received advice by 3 months postpartum. Overall, 44.8% did not meet guidelines for fruit intake. Almost all women did not meet guidelines for vegetable intake (91.3%) or combined F&V intake (92.8%). There was no association between provision of advice at any stage and meeting F&V intake guidelines.

Conclusions:

A high proportion of women had inadequate F&V intake. Since provision of healthy eating advice was not associated with consumption of F&Vs to recommended levels, interventions tailored specifically at promoting F&V intake during and following pregnancy are needed, for this at-risk target group.

P039

The who, what and when of diet goal-setting and self-monitoring during pregnancy

Authors:

Christine Olson, Margaret Demment, Meredith Graham

Purpose:

Goal-setting and self-monitoring are components of effective life-style interventions, but not often included in pregnancy interventions. Online interventions provide a unique opportunity to objectively measure use of intervention components. This study aims to identify the socio-demographic characteristics of pregnant women who set diet goals and self-monitor, what diet goals they set, and when in pregnancy they do.

Methods:

A sample of racially and socioeconomically diverse pregnant women were assigned to the online intervention in a randomized controlled trial to prevent excessive gestational weight gain ($n=1014$). The intervention website included diet goal-setting and self-monitoring tools. Chi-square analysis assessed associations.

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Results:

324 women (32%) set a total of 562 diet goals. 315 (31%) engaged in self-monitoring progress toward goal achievement. Goal-setting was significantly ($p < 0.01$) associated with income and race in expected directions, but not with body mass index (BMI) group, ethnicity, age and parity. The most commonly set goals ($> 10\%$ of total) were to eat more vegetables, eat more whole grains, eat more calcium-rich foods, and eat more fruits. The least commonly set goals ($< 5\%$ of total) were related to eating less fat, stopping overeating, and eating better away from home. Most goals were set near time of entry into the study which could be up to 20 weeks gestation.

Conclusions:

Only about 1/3 of women set diet goals and there were not great differences by socio-demographic characteristics. Goals tended to focus on eating more and not less which presents a challenge to preventing excessive gestational weight gain.

P040

A meta-analysis of postnatal physical activity interventions

Authors:

Anita Cramp, Sarah Gray, Shauna Burke

Purpose:

The health benefits of engaging in regular physical activity in the postnatal period are vast. Unfortunately, research suggests that many postnatal women do not meet current physical activity guidelines. Over the past decade a number of intervention studies have been conducted to increase postnatal women's physical activity levels. The objectives of the study were to: (a) Review published postnatal exercise intervention studies; and (b) conduct a meta-analysis to empirically examine the effectiveness of these interventions to promote physical activity.

Methods:

Databases were searched to identify intervention studies whose primary aim was to increase physical activity among postnatal women. Published randomized controlled trials (RCTs), pilot studies that included only an intervention condition, and quasi-experimental studies were included.

Results:

Our search identified 16 published studies that yielded 31 effect sizes. The mean overall effect size (Hedge's g) was .46 ($SD = .45$, Range = $-.45$ to 1.47). Intervention factors such as type (e.g., physical activity only versus a combined intervention such as physical activity and nutrition), design, length, theoretical foundation, delivery method, and number of intervention contacts were also examined and will be discussed.

Conclusions:

Postnatal physical activity interventions have a small to moderate effect on women's physical activity levels. There were observable differences in the way interventions were developed, implemented, and reported. Furthermore, several moderator variables were found to influence the effectiveness of postnatal physical activity interventions with regard to improving physical activity levels. Additional, high quality postnatal interventions are needed.

P041

A systematic review of behavioral interventions to improve physical activity and dietary behavior during pregnancy

Authors:

Lanay Mudd, Jean Kerver, Todd Buckingham

Purpose:

Despite known benefits, few pregnant women meet physical activity (PA) and dietary guidelines. Intervention studies targeting PA and diet behaviors among pregnant women have had limited success at impacting their primary outcome (e.g., prevention of excessive weight gain, gestational diabetes); however, the effectiveness of combined interventions

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on the intermediate outcomes of changing PA and dietary behaviors has not been systematically assessed. To review the effectiveness of combined PA and diet interventions on increasing PA and improving dietary behaviors during pregnancy.

Methods:

Searches were conducted in PUBMED and EMBASE independently by two reviewers. Inclusion criteria were: Randomized control trial among pregnant women; one intervention arm targeted both PA and diet; and results included baseline and follow-up measures of PA and diet.

Results:

Of 136 relevant abstracts, 55 full-text articles were screened for eligibility and 12 studies met inclusion criteria. Among these, one study found significant improvement in PA only, five studies reported significant improvements in diet only, and three studies found significant improvements in both PA and diet in the intervention group compared to the control group. Among studies successful at changing both behaviors, one utilized techniques based in motivational interviewing and two offered structured group exercise sessions with baseline individualized dietary counseling.

Conclusions:

Previous intervention studies have had limited success at changing PA and diet during pregnancy. Theoretically-designed interventions are needed to promote both PA and healthy diet among pregnant women to improve maternal and fetal health.

P042

Mixed method process evaluation of the 'Healthy Eating and Lifestyle in Pregnancy (HELP)' trial

Authors:

Elinor John, Dunla Cassidy, Lauren Copeland, Helen Stanton, Yvonne Moriarty, Karen Jewell, Sharon Simpson

Purpose:

Maternal obesity is linked to poor health and pregnancy complications. We developed and tested in a pragmatic cluster RCT a group-based intervention for obese pregnant women that targeted physical activity and diet and was facilitated by midwives and slimming world consultants. It was designed to support women during pregnancy to moderate weight gain and reduce BMI one year after birth, in addition to targeting secondary health and wellbeing outcomes for mother and baby. This paper presents the mixed method process evaluation conducted alongside effectiveness assessment, which explored context, reach, dose, fidelity, and implementation, as well as processes of behavior change.

Methods:

A number of methods were used to explore these issues including structured observation, recruitment data, case report forms, session summary forms, questionnaires, semi-structured participant interviews and intervention facilitator focus groups. Interview and focus group data were analysed using thematic analysis.

Results:

Insights were offered into the contextual factors relating to delivery of the intervention and differential receipt across sites, including compliance with diet and activity advice and researcher influence at control sites. Analyses revealed comprehensive data on both individual behavior change as well as the social processes involved, including the group environment and importance of shared experiences, and the value of professional support within the group setting.

Conclusions:

The process evaluation has provided insights into the mechanisms of effect, delivery and reach of the HELP intervention. This will facilitate interpretation of the main study findings as well as potential roll out in the 'real world'.

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P044

Correlations between dietary intake of first-time fathers and their children at 18 months

Authors:

Adam Walsh, Adrian Cameron, Kylie Hesketh, David Crawford, Karen Campbell

Purpose:

Children's learning about food is considerable during their formative years with the influence of parents on children's eating considered pivotal. Research focuses predominantly on maternal influence, while little is known about the relationships between fathers' and children's diets. Greater understanding of this relationship is necessary for the design of appropriately targeted family interventions. The aim of this study was to investigate associations between the diets of first-time fathers and their children at age 18 months.

Methods:

The diets of fathers and their first-born children (n=314) enrolled in the Melbourne Infant Feeding Activity and Nutrition Trial (InFANT) Program were assessed using a previously validated Food Frequency Questionnaire and 3 x 24-hour recalls, respectively. Associations between fathers' and children's fruit, vegetable and non-core food and drink intakes were assessed using linear regression. All analyses were adjusted for mothers' intake and intervention status.

Results:

Associations were found between fruit ($p=0.003$) and sweet snack ($p=0.048$) intake of fathers and children, however, when mothers' intake was adjusted for only fruit intake remained significant ($p=0.014$). No significant associations were found for consumption of vegetables or other non-core foods and drinks in fathers and children.

Conclusions:

This is one of the first studies investigating the relationship between the diets of fathers and young children (infants). Results suggest that associations between dietary intakes of fathers and their children commence at a young age. This study contributes to an understanding of the dietary relationships between fathers and their young children and could inform future interventions in this area.

P045

Characteristics associated with breastfeeding behaviors among women enrolled in the special supplemental nutrition program for women, infants, and children (WIC) in urban and rural Kansas

Authors:

Lisette Jacobson, Philip Twumasi-Ankrah, Michelle Redmond, Elizabeth Ablah, Robert Hines, Judy Johnston, Tracie Collins

Purpose:

To provide insight into characteristics associated with breastfeeding behaviors of urban and rural participants who received benefits from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in Kansas.

Methods:

A secondary analysis was conducted using the Pregnancy Nutrition Surveillance System dataset of women enrolled in the Kansas WIC program in 2011. Geographic residency status was obtained through application of the Census tract-based rural-urban commuting area codes. The total sample size was 17,067 women with 14,268 urban Kansans and 2,799 rural Kansans. Descriptive variables included maternal demographics, program participation, maternal and infant health, and maternal health behaviors. A multivariable binary logistic regression was used to obtain adjusted odds ratios with 95% confidence intervals assessing the characteristics of WIC participants and breastfeeding behaviors. A P-value of $\leq .05$ was considered statistically significant.

Results:

There were statistically significant differences regarding socio-demographics, program participation, and health behaviors among urban and rural WIC participants. Pregnant women in rural areas appeared to have poorer health outcomes compared to those located in urban areas especially in relation to smoking behaviors prior to, during, and after pregnancy. Participants who were Hispanic, young, graduated from high school, earned more than \$15,000/year, and

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enrolled in WIC during the first trimester were more likely to breastfeed. Women who were Black, had a high school education or less, and earned lower wages were less likely to breastfeed.

Conclusions:

Findings will inform WIC program administrators and help enhance breastfeeding services and their delivery to the Kansas WIC population.

P046

The 'good eater': Modelling maternal perception of food fussiness in Australian toddlers - the NOURISH and SAIDI cohorts

Authors:

Rebecca Byrne, Anthea Magarey, Lynne Daniels

Purpose:

Food refusal is part of normal toddler development related to an innate ability to self-regulate energy intake and onset of neophobia. For parents, this 'fussy' stage causes great concern, prompting use of coercive feeding practices which ignore a child's own hunger and satiety cues, promoting overeating and overweight. This analysis defines characteristics of the 'good eater' using latent variable structural equation modelling and the relationship with maternal perception of her child as a fussy eater.

Methods:

Mothers in the control group of the NOURISH and South Australian Infants Dietary Intake studies (n=332) completed a self-administered questionnaire - when child was age 12-16 months - describing refusal of familiar and unfamiliar foods and maternal perception as fussy/not fussy. Weight-for-age z-score (WAZ) was derived from weight measured by study staff. Questionnaire items and WAZ were combined in AMOS to represent the latent variable the 'good eater'.

Results:

Mean age (sd) of children was 13.8(1.3) months, mean WAZ(sd), .58(.86) and 49% were male. The 'good eater' was represented by higher WAZ, a child that hardly ever refuses food, hardly ever refuses familiar food, and willing to eat unfamiliar foods ($\chi^2/df=2.80$, GFI=.98, RMSEA=.07(.03-.12), CFI=.96). The 'good eater' was inversely associated with maternal perception of her child as a fussy eater ($\beta=-.64$, $p<.05$).

Conclusions:

Toddlers displaying characteristics of a 'good eater' are not perceived as fussy, but these characteristics, especially higher WAZ, may be undesirable in the context of obesity prevention. Clinicians can promote food refusal as normal and even desirable in healthy young children.

P047

Evidence for construct validity of the Authoritative Feeding Practices Questionnaire

Authors:

Elena Jansen, Lynne Daniels, Kimberley Mallan, Jan Nicholson

Purpose:

The Authoritative Feeding Practices Questionnaire (AFPQ) is a recently constructed measure of (non-) responsiveness and structure in the early child feeding context. The 9-factor structure has been validated in a sample of 462 mothers of 2-year-old children. The purpose of this study was to extend the validity testing of the AFPQ by evaluating the construct validity against established measures of two theoretically-relevant dimensions of general parenting (autonomy-encouragement and overprotection). It was expected that autonomy-encouragement would be positively associated with the structure-related factors and 'Covert Restriction'; while overprotection would be positively associated with the non-responsive factors and 'Overt Restriction'.

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Methods:

Data were available from 462 mothers and children (age 21-27 months), enrolled in the NOURISH RCT. Structural Equation Modelling was used to assess cross-sectional associations between two dimensions of general parenting (autonomy-encouragement and overprotection) and the 9 correlated feeding practices from the AFPQ, adjusting for a range of maternal and child covariates.

Results:

As predicted, autonomy-encouragement was positively associated with 'Structured Meal Setting' and 'Covert Restriction'. Also in line with predictions, overprotection was positively associated with all of the non-responsive feeding practices ('Distrust in Appetite', 'Reward for Behavior', 'Reward for Eating', 'Persuasive Feeding') and 'Overt Restriction'. No associations between autonomy-encouragement and 'Structured Meal Timing' and 'Family Meal Setting' were observed.

Conclusions:

Evidence for construct validity was provided for seven of the feeding factors. Further validation of the AFPQ can establish the robustness of the factor structure in new populations and the predictive ability of the tool.

P048

Patterns of PA in first time mothers: Are women meeting the guidelines and how does clinician advice influence PA following childbirth?

Authors:

Paige van der Pligt, Karen Campbell, Megan Teychenne, Kylie Ball, Kylie Hesketh, David Crawford

Purpose:

Regular physical activity (PA) during the postpartum period (PPP) is associated with numerous physical and mental health benefits and increases the chance of a woman returning to pre-pregnancy weight. Little is known about how best to promote PA during the PPP, to ensure women are sufficiently active following childbirth. The aim of this study was to investigate patterns of PA and associations between provision of clinician advice and PA patterns in first-time mothers.

Methods:

Women (n=448) enrolled in the Melbourne InFANT Extend study completed a cross-sectional questionnaire at ~3 months postpartum. The validated Active Australia Survey was used to assess PA time for the previous week. PA advice received by a postnatal healthcare worker was self-reported. Independent t-tests assessed associations between advice and time spent walking, in moderate activity and vigorous activity. Logistic regression assessed associations between advice and meeting Australian recommendations for PA (≥ 150 minutes/week).

Results:

Mean time spent walking (251.97 ± 196.78 minutes/week) was greater than time spent in moderate (36.68 ± 88.58 minutes/week) or vigorous activity (61.74 ± 109.96 minutes/week). Overall, 76.1% of women met recommendations for PA and half (51.9%) received PA advice. There was no significant association between PA advice and time spent walking or in moderate or vigorous activity or with meeting PA recommendations.

Conclusions:

Walking was the most prevalent PA reported by women. Despite many women meeting PA recommendations, advice did not influence PA patterns. Identification of strategies to promote PA following childbirth are needed, and further examination into the content of clinician advice is warranted.

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P049

Can a motivational interviewing training intervention for pediatric health care providers improve weight management counseling?

Authors:

Linda Shalon, Patricia Risica, Kelli Drenner, Barbara Robinson, Ariana Raufi, Kim Gans

Purpose:

The goal of this pilot study was to determine whether a brief motivational interviewing-based training (MIBT) would improve pediatric primary care providers (PPCPs) counseling for obesity prevention.

Methods:

Individual interviews were conducted with 11 PPCPs to determine current approaches and challenges to obesity prevention counseling with families. A brief MIBT including 3 two-hour long training sessions and a one-page MI-based clinical tool was developed to address these challenges. The MIBT was conducted at a community health center in RI with five pediatric PCPs. Changes in PCP counseling were compared) using pre-post (paired t-tests) PCP written surveys, parent/guardian exit interviews conducted after well child visits, and PCP telephone exit interviews.

Results:

At baseline, PCPs did not feel successful in counseling patients and families about healthy eating and activity behaviors (HEAB). From pre to post: PCPs reported the MIBT helped them feel significantly more confident in counseling about HEAB ($p<0.02$), and their MI-based skills were significantly stronger ($p=0.002$). Parents reported significant increases in perceptions that PCPs addressed fast foods, activity and television time extensively ($p<0.05$) during clinic visits. On exit interviews, PCPs reported that MIBT improved their HEAB counseling. Some PCPs reported dramatic changes in their style of questioning and focus on weight-related topics. Others felt MIBT reinforced previous training.

Conclusions:

A brief MIBT with PCPs achieved improvements in PCP's skills and confidence and delivery of HEAB counseling re. obesity prevention. Further research should investigate the efficacy of this approach in a larger study to improve children's weight and HEAB.

P050

Students who experienced weight-based discrimination are more likely to try to lose weight regardless of BMI status

Authors:

Natalie Golaszewski, Cayley Velazquez, Keryn Pasch, Natalie Poulos, Alexandra Loukas

Purpose:

To examine the relationship between perceived weight-based discrimination (WBD) and weight-related behaviors among a sample of middle school students.

Methods:

Participants included 291 middle school students (m age=12.4; 60.6% female; 65.1% White). Students completed a self-report survey. WBD was measured with 4 items (e.g., being put down because of weight); participants responding positively to one or more items were coded as 1, where all others were coded as 0. Weight-related behavior was measured with 1 item asking what students were currently trying to do with their weight (e.g., lose weight, stay the same weight); participants trying to lose weight were coded as 1, where all others were coded as 0. Logistic regression analyses were run to examine the association between WBD and weight-related behaviors controlling for age, gender, and BMI z-scores.

Results:

Approximately 15% of students reported WBD and 41% reported currently trying to lose weight. Overall, findings indicate that students who reported WBD were four times more likely to be currently trying to lose weight as compared to those who were not currently trying to lose weight ($OR=4.03$, 95% $CI=1.78, 9.15$).

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Conclusions:

The experience of weight-based discrimination is associated with a greater likelihood of currently trying to lose weight. This finding could be problematic as stress associated with WBD may increase the pressure middle school students feel to engage in weight-loss behaviors. Future research should explore the types of weight-loss behaviors students are engaging in to determine the relative healthfulness of these efforts.

P051

Body image, perceived stress, and intuitive eating in minority adolescents

Authors:

Gillian A. O'Reilly, Donna Spruijt-Metz, Marc J. Weigensberg

Purpose:

This study examined the relationship between body image (BI) and intuitive eating (IE) (an adaptive eating style associated with metabolic health and lower BMI) and the mediational role of perceived stress (PS).

Methods:

BI (Body Image States Scale), PS (Cohen's Perceived Stress Scale), and IE (Tylka Intuitive Eating Scale) data were from 189 Latino and African American adolescents (mean age = 15.2 ± 2.2 years, 44.4% female, 36.4% African American). Structural equation modeling was used to determine the association between BI and IE latent factors (unconditional permission to eat (UPE), eating for physical reasons (EPR), trust of physiological hunger cues (TPC)) and the mediating role of PS.

Results:

Better BI was associated with greater UPE ($b=0.109$, $SE = 0.045$, $p<0.05$) and greater TPC ($b=0.138$, $SE=0.050$, $p<0.05$). BI 1 SD above the mean corresponded to 0.2 SD increase in UPE and 0.2 SD increase in TPC. PS fully mediated the relationship between BI and EPR (indirect effect: $b=0.044$, $SE=0.019$, $p<0.05$). Better BI was associated with lower PS ($b=-0.104$, $SE=0.029$, $p<0.05$). BI 1 SD above the mean corresponded to 0.3 SD decrease in PS. Lower PS was associated with greater EPR ($b=-0.428$, $SE=0.139$, $p<0.05$). PS 1 SD below the mean corresponded to 0.2 SD increase in EPR.

Conclusions:

Findings suggest that higher BI may aid adolescents' ability to eat in response to physiological cues, decreasing their risk for eating in response to emotional and situational cues. Improving BI and reducing PS may be important for improving eating behaviors in adolescents.

P052

Weight concerns and eating practices among urban adolescent girls of Sikkim and Kolkata in India: A comparative study

Authors:

Susmita Mukhopadhyay, Nivedita Som, Shailendra Kumar Mishra

Purpose:

The present study aims to compare the prevalence of weight concerns and the subsequent modification in eating behaviors among adolescent girls living in two distinct geographical regions, Kolkata and Sikkim.

Methods:

Two cross sectional studies were conducted in Sikkim and Kolkata with a total of 506 adolescent girls aged 14-19 years. Out of them, 282 and 224 girls were selected from Kolkata and urban areas of Sikkim respectively. Information on socio demographic characteristics, weight related concerns and dietary behaviors were collected using standard pre tested questionnaires. Anthropometric measurements (height and weight) were taken following standard techniques. Both bivariate and multivariate analyses were used to analyse the data.

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Results:

Girls of Kolkata report significantly higher incidence of weight concerns ($p=0.002$) and subsequent changes in eating patterns ($p=0.01$) compared to girls of Sikkim. Multivariate logistic regression shows that all variables in the domain of weight concerns and intake of few food items emerged as significant factors for predicting the disparity between adolescent girls living in two regions.

Conclusions:

Concerns over weight and modifications in eating practices are slowly creeping in among adolescent girls of both Kolkata and urban areas of Sikkim. However, relatively higher prevalence of weight concerns and dietary behavior modifications among Kolkata girls might be mediated through the cosmopolitan nature of the city and enormous socio economic disparity compared to the nature of hilly urban areas of Sikkim, where rapid changes in lifestyle is also on the rise.

P053

Beyond stress and sleep problems: Perceived weight-based discrimination is a unique correlate of depression symptoms among middle school aged students

Authors:

Natalie Golaszewski, Keryn Pasch, Alexandra Loukas

Purpose:

To determine whether perceived weight-based discrimination (PWBD) is a unique correlate of depressive symptoms over and above reported stress levels and sleep problems among middle school aged students.

Methods:

Participants included 291 middle school students (m age=12.4; 60.6% female; 65.1% White). Students' reported experiences of PWBD perpetrated by 5 different sources (teachers, parents, other adults, peers, and good/best friends). Experiencing at least one type of weight discrimination from at least one source was coded as 1 and never experiencing weight discrimination was coded as 0. Depressive symptoms were measured with the 9-item CESD scale (ex. I felt lonely). A sleep problems index was created from two (ex. Trouble falling asleep). Stress levels were self-reported on a scale from 1 being not stressed at all and 10 very stressed. Students self-reported age and gender. BMI z-scores were calculated from reported height and weight. Linear regression analyses were conducted to determine the relationship between PWBD and depressive symptoms controlling for age, gender, BMI z-score, sleep problems, and stress levels.

Results:

Approximately 15% of participants reported PWBD. Results suggest that PWBD was positively, significantly associated with depressive symptoms ($B=.18$ ($SE=.07$) $p=.01$) over and above reports of sleep problems, stress levels, age, gender, and BMI z-scores.

Conclusions:

The negative experience of PWBD appears to be a unique contributor to depressive symptoms among middle school adolescents. Given these findings, future research is needed which explores the mechanisms for this association as well as the potential factors which may buffer or exacerbate these relationships.

P054

BMI mediates the effects of low income on preschool children's executive control and social-emotional problems

Authors:

Pooja Tandon, Stephanie Thompson, Lyndsey Moran, Liliana Lengua

Purpose:

Few studies have attempted to disentangle the causal directions among weight status, socioeconomic status (SES), and cognitive and behavioral functioning.

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Methods:

Study participants (n=306) were assessed at ages 36-39 months (T1) and 63-67 months (T2) through neuropsychological and behavioral measures of EC and anthropometry. Mothers completed questionnaires and teachers rated children's academic readiness, social competence and adjustment. Path analyses were conducted.

Results:

Income was positively related to T1 EC and negatively related to T1 BMI. T1 BMI was negatively related to T2 EC, after controlling for T1 EC. T1 EC was not related to changes in BMI, which was highly stable. Controlling for gender, income and cumulative risk, T2 EC predicted greater academic readiness and social competence, and lower adjustment problems at T2. T2 BMI was directly related to higher T2 adjustment problems. There was a significant indirect effect of income on T2 EC through T1 BMI. There were significant indirect effects of T1 BMI on academic readiness, social competence and adjustment through T2 EC.

Conclusions:

We found that BMI mediates the effect of income on preschool children's EC, and has negative implications for their academic readiness, social competence and behavioral adjustment. EC at age 3 did not predict changes in BMI from age 3 to 5. A child's BMI at age 5 was directly related to higher adjustment problems. The possible coexistence of obesity and cognitive/social-emotional problems on an already high risk population of children is of significant concern and underscores the importance of early interventions.

P055

Do Latinos who have high neighborhood cohesion and practice sufficient physical activity or use public open spaces for physical activity report fewer depressive symptoms?

Authors:

Lilian G. Perez, Elva M. Arredondo, Thomas L. McKenzie, Margarita Holguin, John P. Elder, Guadalupe X. Ayala

Purpose:

12% of adult Latinos in the US experience at least one depressive symptom. Mental and physical health have been linked to neighborhood cohesion, where greater neighborhood cohesion is related to fewer depressive symptoms as well as increased leisure-time physical activity (PA). Little is known, however, about the factors that moderate the relationship between depression and neighborhood cohesion among Latino adults. The objectives of this study were to examine the moderating roles of using public open spaces for PA and levels of moderate-to-vigorous physical activity (MVPA) on the association between depression and neighborhood cohesion.

Methods:

Latino adult residents from San Diego were recruited through multistage sampling (N=397) and consented to complete a one-time interview and height and weight measurement.

Results:

An inverse relationship was found between depression and neighborhood cohesion after adjusting for age, gender, and income (OR=0.8; 95% CI: 0.6-1.0). Levels of MVPA did not moderate the association; however, active use of public open spaces did.

Conclusions:

Latinos reporting not using public open spaces for PA and reporting low levels of neighborhood cohesion had more depressive symptoms than those who used the open spaces for PA. The findings have important implications for programs and policies targeting use of public open spaces as potential venues for supporting mental health in Latinos. Further research is needed to understand the function of public open spaces (e.g. for active use or social interaction) in Latino communities.

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P056

Perceived weight associated with disordered eating behaviors and physical activity among young men

Authors:

Marjukka Nurkkala, Anna-Maria Keränen, Raija Korpelainen

Purpose:

To evaluate the existence of disordered eating behaviors (DEBs) among young men and the association of perceived weight with DEB and daily physical activity. Obese young men have been found to exhibit binge eating and unhealthy weight control behaviors, such as compulsive exercise, as compared with normal weight peers.

Methods:

The study is a part of the wide multidisciplinary MOPO study. The data consists of conscription-aged young men in the city of Oulu in Finland in 2010-2012 ($n = 3499$). The mean age was 17.8 years (SD 0.8). DEB was evaluated by EDI or SCOFF questionnaires. The young men were asked about their daily total physical activity (< 1 h, $1-2$ h, > 2 h) and perceived weight. The height, weight and BMI were measured at the call-ups for the military service. Statistical analyses were done using linear regression.

Results:

DEB questionnaires were filled in by 1,934 young men. DEB was classified in ninety-three (4.8%) young men. Fifty-one (55%) of them were overweight, and of those, forty-five perceived themselves as overweight. One of three underweight perceived himself as underweight. DEB had about one-seventh (51/375) subjects who perceived themselves as overweight, and 3% (41/1536) of them perceived themselves as underweight or of the ideal weight ($p < 0.001$). Perceived overweight was associated with a twofold risk of physical activity, which is less than an hour per day, compared with perceived underweight or ideal weight (OR 0.53, 95% CI 0.41-0.69).

Conclusions:

Perceived overweight in young men is associated with DEB and low physical activity.

P057

Antecedents of body dissatisfaction and psychological well-being

Authors:

Javier Molina-García, Octavio Álvarez, Ana Queral, Isabel Castillo

Purpose:

This study examined body mass index (BMI) and perceived physical ability as antecedents of body dissatisfaction as well as its relationship with physical activity level and subjective vitality among men and women.

Methods:

The sample was composed of 501 university students (59.9% female) between 18 and 34 years old ($M = 21.64 \pm 3.12$ years). Data were collected using a self-administered survey. Structural equation modeling was used to analyze associations among study variables.

Results:

Path analysis revealed that BMI positively predicted body dissatisfaction in both gender groups ($\beta_{\text{men}} = 0.43$ and $\beta_{\text{women}} = 0.48$), whereas perceived physical ability negatively predicted body dissatisfaction ($\beta_{\text{men}} = -0.41$ and $\beta_{\text{women}} = -0.23$). Indeed, perceived physical ability was a positive predictor of subjective vitality in both gender ($\beta_{\text{men}} = 0.36$ and $\beta_{\text{women}} = 0.26$) and a positive predictor of physical activity level only in women ($\beta = 0.25$). Finally, body dissatisfaction negatively predicted subjective vitality only in women ($\beta = -0.11$), whereas physical activity level was a positive predictor of subjective vitality only in men ($\beta = 0.17$).

Conclusions:

The present findings revealed gender differences in the associations between model variables. BMI and perceived physical ability contributed to the prediction of body dissatisfaction in both genders. Body dissatisfaction was a negative antecedent of subjective vitality only in women groups.

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P058

Family and peers weight teasing: Is there any correlation between nutritional status and body image?

Authors:

Ana Carolina Leme, Sonia Tucunduva Philippi, Brunna Viterale, Bruna Escarabajal, Glícia Chagas de Moura, Giovanna Chrispim

Purpose:

To assess whether weight related teasing is associated with body image and nutritional status in Brazilian adolescents.

Methods:

This was a cross-sectional study with 173 adolescents (56.1%, M=15.3±1.53 years) enrolled in secondary and high schools in the city of São Paulo, Brazil in 2013. Participants completed a validated self-reported questionnaire to assess family and peers teasing and body dissatisfaction. Body Index Mass was classified according to the WHO percentiles for adolescents. Descriptive analyses, bivariate correlations and ANOVA were conducted with differences considered significant at $p \leq 0.05$.

Results:

27% reported being teased by a family member (35.5% girls and 20.6% boys -15.8% by siblings and cousins). Thus, 38.2% reported being teased by a peer. Being teased by family members was positive correlated to weight dissatisfaction ($r=0.35$, $p=0.01$), face ($r=0.31$, $p=0.03$) and stomach ($r=0.40$, $p=0.04$); and being teased by peers were correlated to body size ($r=0.32$, $p=0.01$), waist ($r=0.31$, $p=0.05$) and stomach ($r=0.31$, $p=0.02$). Regarding nutritional status, obesity and thinness were associated to body dissatisfaction ($p=0.00$).

Conclusions:

Nutritional status and sex appeared to influence body dissatisfaction in adolescents. Health-care providers should involve parents and youth in discussing teasing concerns. Moreover, parents, schools and communities should consider creating more effective ways to prevent teasing. More studies should be conducted to assess the relation between teasing and the impact on health.

P059

Capturing commuting behavior with public webcams and crowdsourcing

Authors:

Rebecca Gernes, J. Aaron Hipp, Deepti Adlakha, Agata Kargol, Robert Pless

Purpose:

Our team is investigating a line of research using publically available outdoor webcams, such as street intersection webcams, to capture active transportation in urban settings. A necessary initial step in this work is understanding the prevalence of active transportation across a variety of captured webcams.

Methods:

Using the Archive of Many Outdoor Scenes, 11,408 webcam photographs were captured over two weeks (7am-7pm) for commercial and residential street intersections in Washington, DC. Amazon Mechanical Turk (MTurk) was used to crowd-source image annotation, counting the number of pedestrians, cyclists, and vehicles per image. Descriptive data was analyzed including peak active transportation by time of day, day of week, and season.

Results:

A total of 13,467 pedestrians and 932 cyclists were observed in the commercial intersection, compared to 577 pedestrians and 160 cyclists in the residential location. Pedestrian activity peaked at three times downtown (9am, 1pm, 6pm) and twice in the residential location (8am and 6pm). Afternoon biking activity peaked an hour earlier (6pm) in the downtown location than the residential location (7pm). Pedestrian activity was highest on Wednesdays for both groups. Both locations experienced the highest rates of biking and pedestrian activity during the summer season and on week-days. Findings are consistent with previous observation and personnel-intensive studies of peak commuting activity.

Conclusions:

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Findings suggest webcams and crowdsourcing have great potential for capturing active transportation patterns. The use of public webcams and MTurks offer an inexpensive (US\$0.02/photo) means to evaluate patterns of commuting behavior and potentially the effectiveness of built environment policies and interventions.

P060

Behavioral counseling self-efficacy and skill usage in registered dietitians (RDs) implementing a nutrition counseling approach

Authors:

Lorian Taylor, Stephanie Moriartey, Janet Stadnyk, Carlota Basualdo-Hammond

Purpose:

The purpose of this study was to identify the self-efficacy, skill usage, beliefs and training needs of RDs trying to implement a nutrition counseling approach. Little research has been done to identify RD beliefs, support, self-efficacy and actual skill usage of the recent nutrition counseling approach (NCA) advocated by the American Academy of Nutrition and Dietetics.

Methods:

This cross-sectional survey was administered in April to May 2013 using SurveyMonkey to all RDs employed by provincial healthcare in Alberta, Canada. Participants were 348 RDs from primary, secondary and tertiary levels of care. The survey included the Dietitian Counseling Self-efficacy Survey, theory of planned behavior (TPB) items, and questions on job characteristics, training needs, knowledge and support of the recommended NCA. TPB items were thematically analyzed. Independent samples t-tests and chi-square tests were used to compare RDs who counseled most patients to few patients. Multiple regression analyses were performed to assess relationships among variables.

Results:

RDs identified advantages and disadvantages, facilitators, barriers and people who support their use of a NCA. RDs who rated their knowledge, competence and high importance of a NCA were more likely to counsel more of their patients, work in an outpatient setting, and employ more of the recommended strategies ($p < 0.01$). RD reported self-efficacy was fairly high and skill usage of the recommended strategies was frequent. Years working as a RD and number of counseling hours a week significantly predicted self-efficacy scores.

Conclusions:

Study results can be used to inform training programs in organizations implementing a NCA.

P061

Outdoor MEDIA coding: The development and reliability of coding descriptive characteristics and themes of outdoor food and beverage advertisements

Authors:

Natalie Poulos, Keryn Pasch

Purpose:

To present key steps in development of outdoor food and beverage coding protocols and reliability of the associated tools.

Methods:

All food and beverage (FB) advertisements (i.e., any sign or image that promoted a food or beverage product) located within a half mile of 34 middle schools, 13 high schools, and 9 hospitals were documented as part of the Outdoor MEDIA Project. Photographs of advertisements were reviewed by three independent research team members to develop possible codes for descriptive information and themes. 51 descriptive and 26 themes codes were selected to be included on the coding protocols and associated tools. The protocols and tools were then pilot tested. Reliability estimates of percent agreement were calculated.

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Results:

For descriptive coding, advertisements from 3 schools were included (n=464 advertisements; range 127-172 per school). 42.0% were free-standing, 33.2% were fast food, and 16.6% included price. Mean percent agreement between coders was 91.2% (SD=0.02). For theme coding, 299 advertisements from 2 schools were included. Percent agreement between coders was 90.3% (SE=0.05). Text logos appeared the most often (139 times, 46.5%), followed by FB text (67 times, 22.4%) and FB image (62 times, 20.7%). 4.7% of advertisements were youth oriented (n=14).

Conclusions:

Despite the diversity of outdoor FB advertising, both descriptive information and themes of food and beverage advertisements can be coded with high reliability. Future research should consider application of this protocol and tool as it can likely be used across many channels and settings to describe the components of food and beverage advertising.

P062

Feasibility of 24-hour monitoring of sleep, sedentary, and active behaviors with objective sensors in middle-aged women

Authors:

Jennifer Huberty, Diane Ehlers, Jonathan Kurka, Barbara Ainsworth, Matthew Buman

Purpose:

This study assessed the feasibility of three wearable sensors for 24-hour monitoring of sleep, sedentary, and active behaviors in women 30-64 years.

Methods:

18 inactive women (M age = 45.6 ± 10.0) wore the ActiGraph GT3X+, GENEActiv, and BodyMedia SenseWear Mini for three consecutive weeks on their non-dominant hip, wrist, or upper arm, respectively, and recorded daily wake, bed, and non-wear times in a logbook. Women received feedback about their daily activity and sleep quality. Feasibility was measured using satisfaction surveys, interviews, and monitor wear time.

Results:

The SenseWear (92.9%) and GENEActiv (88.3%) were perceived as easier to wear than the Actigraph (52.9%) stating the SenseWear was “out of the way” and “beeped so you know it’s working” while the GENEActiv was “similar to a watch.” The SenseWear (76.5%) placement was preferred versus the GENEActiv (57.1%) or ActiGraph (52.9%) because they “didn’t notice it on their arm.” While all monitors were comfortable during sleep (77.1%), 38.9% felt 24-hour monitoring for seven days was too long. Wear time during wake periods was valid (>10 hours during wake periods) on 90.5% (ActiGraph), 98.4% (GENEActiv), and 93.3% (SenseWear) of eligible days. Mean wear time during wake on valid days was similar (ActiGraph: M = 918.8 ± 110.0 minutes; GENEActiv: 954.6 ± 87.4; SenseWear: M = 904.7 ± 109.8). Reasons for non-wear included appearance, comfort, and inconvenience.

Conclusions:

Continuous 24-hour monitoring of sleep, sedentary and active behavior in middle-aged women is feasible, and arm- or wrist-worn sensors are preferred to the hip-worn sensor.

P063

Congruent validity and reliability of two metabolic systems to measure resting metabolic rate

Authors:

Whitney Welch, Scott Strath, Marin Koeber, Kimberly Winker, Ann Swartz

Purpose:

To determine the congruent validity and the intra- and inter-day reliability of resting metabolic rate (RMR) measures assessed by the Parvomedics Trueone 2400 (PARVO) and Cosmed K4b2 (COS) portable metabolic system.

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Methods:

Participants aged 18 to 50 years old underwent three RMR measurements using both devices, for a total of six measurements, over two consecutive mornings. Measured VO₂, VCO₂, kcal/day, and HR values were averaged over a minimum of 10 minutes, following standard procedures. RMANOVA are reported to determine intra- and inter-day reliability within each system. To determine congruent validity between the two systems paired sample t-tests were used.

Results:

15 males (27.7±8.5 y, 25.1±3.3 kg.m⁻², 2041±293 kcal/day, 58±7 bpm) and 11 females (28.2±6.0 y, 23.9±3.3 kg.m⁻², 1610±319 kcal/day, 54±9 bpm) completed the study. No significant ($p<0.05$) within system differences in PARVO VO₂, VCO₂, and kcal/day were revealed. The COS showed no significant between- or within day difference in VO₂ and VCO₂, however, a significant between-day difference in kcal/day (COS1: 1812±432 vs. COS3: 2006±427; $p=0.045$) was present. When the two systems were compared, results indicate no significant difference between PARVO and COS for VO₂ ($p=0.218$), VCO₂ ($p=0.391$), or kcal/day ($p=0.182$) values measured at time 1.

Conclusions:

The lab-based PARVO is a reliable metabolic systems with no intra- or inter-day differences in measurements of RMR. In addition, the PARVO and COS showed no significant difference between measured values, indicating congruent validity between the systems.

P064

Validation of videography for portion size estimation in a university cafeteria

Authors:

Danielle Perry, Shelby Zimmerman, Kate Heelan

Purpose:

Digital photography has been validated as a method to measure portion sizes and food intake in cafeteria settings (Williamson et al., 2003). However, pictures capture only one dimension and food descriptions are not easily obtained. Videography can capture both dynamic audio and visual elements of foods. Our purpose was to validate videography as a method for estimating unhealthy food portions consumed in a university cafeteria.

Methods:

66 meals chosen by university students from 16 menus were video recorded, capturing multiple angles, while researchers verbally estimated portion sizes and described food. Foods were subsequently weighed on a food scale. Plate waste was assessed via digital pictures and weighed to determine quantities of foods consumed. High fat (>5g/serving) and/or high calorie (>200kcal/serving) foods were identified as “red foods” using the university cafeteria online nutrition analysis menu. To test validity, portions of “red foods” were estimated through recorded videos and then compared to weighed portions using correlation coefficients and Bland-Altman regression.

Results:

Videography and weighed portions were highly correlated ($r=0.88$, $p<0.05$) with no significant differences between portions (weighed - video = -0.12 ± 1.14 , $p=0.40$).

Conclusions:

The combination of videography and pictography is a valid method for estimating portion sizes. This method is easy and efficient to utilize, especially in a large cafeteria setting, due to its unique audio features and ability to capture various dimensions and angles.

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P065

Making sense of health perceptions through interpreters - issues for sport and physical activity researchers working with culturally diverse populations

Authors:

Tea O'Driscoll, Erika Borkoles, Lauren Banting, Remco Polman

Purpose:

There is an emerging trend worldwide to conduct qualitative research with refugees and culturally-diverse populations in collaboration with interpreters. However, there are very limited guidelines or examples of experiences outlining best practice for research in this context. This presentation is an exploration of some key methodological and practical issues that we faced in conducting cross-language and cross-cultural research on perceptions of health, and sport and physical activity (PA) participation with newly arrived Karen refugees in Australia.

Methods:

Working with community leaders who acted as interpreters and co-researchers, we conducted in-depth interviews with Karen refugees. The interview contexts were guided by cultural considerations and customs, such as sitting on the floor during interviews. We independently interviewed the interpreters after the study to gain their insight on aspects of the research process. We adopted the Interpretative Phenomenological Analysis (IPA) approach, and explored factors of sport and PA and the meaning of being healthy and active in this group.

Results:

We identified several key considerations, which we organised into two major themes of 1) methodological dilemmas when co-researching with community leaders who also act as interpreters; 2) difficulties in deriving meaning through IPA when working in cross-cultural and cross-language settings.

Conclusions:

In this research, primary data collection took place through bi-lingual research collaborators and raised several methodological dilemmas that are rarely discussed in sport, exercise and PA contexts. Our findings aim to guide others and facilitate improvement of how researchers and service providers can conduct culturally appropriate and effective research and practice.

P066

Acceptability of and barriers to wearing Global Positioning System devices among adult Latinas

Authors:

Jessica Haughton, Liliana Quezada, Lilian G. Perez, Suneeta Godbole, Kevin Patrick, Jacqueline Kerr, Elva M. Arredondo

Purpose:

Global Positioning System (GPS) devices are used in physical activity research to track movement of individuals and to understand interactions between the environment and physical activity. Little is known about the acceptability of GPS device use, particularly among minority populations. This study explored perceptions about GPS devices among a Latina population living near the US-Mexico border.

Methods:

Interviews were conducted with ten Latinas (mean age: 49.3 years (SD= 6.83)). Eight participants were born in Mexico and six had less than a high school education. Participants were provided with a description of GPS and were shown various GPS devices. A bilingual, bicultural research assistant conducted 30-minute interviews that were audio recorded, transcribed, and coded in their original language (Spanish) by two research team members using a grounded theory approach.

Results:

Participants reported low knowledge and experience using GPS, but many stated their children used it. Barriers to wear clustered in several themes: Perceptions of being tracked or followed; safety (e.g. exposure to radiation); and sharing of personal information. The majority of participants were concerned about a violation of privacy when wearing the device, for both themselves and their family. Other concerns included: Fear of government surveillance; device loss; discomfort wearing device; and embarrassment with lack of knowledge about GPS.

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Conclusions:

For GPS device use to increase in physical activity research, their acceptability among diverse populations becomes increasingly important. Researchers should develop and evaluate culturally appropriate strategies to inform study participants about the risks and benefits of using GPS devices.

P067

Children's physical activity while gardening: Development of a valid and reliable direct observation tool

Authors:

Beth M. Myers, Nancy M. Wells

Purpose:

Gardens are a promising intervention to promote physical activity and foster health. However, because of the unique characteristics of gardening, no extant tool can thoroughly capture physical activity (PA), postures, and motions that take place while gardening.

Methods:

The Physical Activity Research & Assessment tool for Garden ObservatioN (PARAGON) was developed to assess children's physical activity levels, tasks, postures, motions, associations, and social interactions while gardening. PARAGON uses momentary time sampling in which a trained observer watches a focal child for 15-seconds and then records behavior for 15-seconds. Sixty-five children (38 girls, 27 boys) at four elementary schools in New York State were observed over eight days. During the observation, children simultaneously wore GT3X+ accelerometers.

Results:

The overall inter-rater reliability was: 88 percent agreement and Ebel was .97. Percent agreement values for activity level (93%), garden tasks (93%), motions (80%), associations (95%), and interactions (91%) also met acceptable criteria. Construct validity was established by previously validated physical activity codes and by confirmation of concurrent validity hypotheses with accelerometry.

Conclusions:

PARAGON is a valid and reliable observation tool for assessing children's physical activity in the context of gardening. The development of a valid and reliable tool to measure the effects of gardening on children's physical activity makes possible the assessment, evaluation, and improvement of garden interventions as an environmental strategy to promote children's health.

P068

Usability of the Quest to Lava Mountain (QTLM): A serious computer game targeting healthy dietary habits in children

Authors:

Shreela Sharma, Ross Shegog, Michael Pomeroy, Deanna Hoelscher

Purpose:

To describe the results of the usability testing of the Quest to Lava Mountain (QTLM), a serious, interactive, theory-based, adventure role-playing computer game that educates children ages 8 to 12 years about healthy nutrition choices and environmental protection using stealth learning strategies.

Methods:

A total of six low-income schools in Texas were matched into pairs and randomly assigned to intervention or control group (3 schools per group). 4th and 5th grade children (n=53, 56% male, 47% Hispanic) in the intervention schools played QTLM as part of their regular school or after-school program for 90 minutes per week for six weeks. The control group continued with usual care. A usability survey was administered post-intervention to the children in the intervention group to obtain data on the acceptability of QTLM and its various components.

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Results:

Of the 46 students who completed the usability survey, a majority indicated that they liked the game a lot (90%), game worked just right (87%), would help them make healthy food choices (80%), and they would like to play it again (89%). Most also indicated that they believed the knowledge communicated in QTLM could be trusted (85%), and that the game was as much or more fun than the health lessons they received at school (93%). A majority of the participants did not report any difficulties in playing the game.

Conclusions:

Introducing the QTLM video game into the school setting is a promising and fun strategy for promoting nutrition education concepts in an engaging way.

P069

Predicting use of effective responsive, structure, and non-directive control vegetable parenting practices with the Model of Goal Directed Behavior

Authors:

Cassandra Diep, Alicia Beltran, Tzu-An Chen, Debbie Thompson, Teresia O'Connor, Sheryl Hughes, Janice Baranowski, Tom Baranowski

Purpose:

Variables in the Model of Goal Directed Vegetable Parenting Practices (MGDVPP) have been shown to predict parents' use of effective vegetable parenting practices (EVPP). Psychometric analysis revealed the EVPP composite scale had three underlying subscales (responsiveness, structure, and non-directive control). It is important to examine whether the same MGDVPP variables predict each subscale or if there are differences in predictors among subscales and/or composite EVPP. This study presents the modeling of responsive, structure, and non-directive control EVPP using the MGDVPP.

Methods:

Parents (n=307) of preschool children completed an internet survey on MGDVPP items. Block regression modeling tested three models: One each with responsive, structure, and non-directive control EVPP as the dependent variable. Each MGDVPP variable (as scales with multiple subscales) was entered as predictors in separate and sequential blocks: Demographics, intention, intrinsic motivation, barriers, autonomy, relatedness, self-efficacy, habit, anticipated emotion, perceived behavioral control, attitude, and lastly norms.

Results:

A habit subscale predicted responsive EVPP. Structure EVPP predictors included a barrier, two habit, and an attitude subscale. Several demographics, a habit, three intentions, and a perceived behavioral control subscale predicted non-directive control EVPP. The adjusted R² for the final responsive, structure, and non-directive control EVPP models were 0.432, 0.310, and 0.515, respectively.

Conclusions:

This was the first study to test MGDVPP scales predicting the use of EVPP subscales. Further research is needed to assess the predictiveness of these subscales in longitudinal studies, their actual meaning to parents, and their utility in vegetable-related interventions.

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P070

A Geographical Information Science (GIS) approach to conducting area-level comparative analysis of study areas in a community-wide obesity prevention intervention study - the case of Texas CORD

Authors:

Abiodun Oluyomi, Allison Byars, Casey Durand, Courtney Byrd-Williams, Shreela Sharma, Deanna Hoelscher, Nancy Butte, Steve Kelder

Purpose:

The objective of this article is to describe how Texas Childhood Obesity Research Demonstration (CORD) project used geographical information systems (GIS) approaches to select the intervention and comparison catchment areas. The project was designed to be implemented in low-income, ethnically diverse areas in Texas, USA.

Methods:

Our methodology for the ascertainment of comparability between the intervention and comparison study sites included 2 phases. Area-level (from the 2010 Census) and school level data (obesity, fitness, free/reduced lunch) were used to create spatially exclusive geographic areas used for intervention vs. comparison conditions. Secondly, we conducted a series of statistically driven comparisons. Study sites were compared on sociodemographic and income characteristics, food assets, and physical activity assets. Geographical Information Systems software and packages were used to assemble spatial data, retrieve spatially referenced data, and integrate multiple spatial data sets. We used the student's t-test for statistical analysis.

Results:

A total of 47 individual comparisons were performed across 17 different characteristics of the three major themes (sociodemographics, food assets, and physical activity assets). Of all the comparisons performed, only three (age, ethnicity and tenure) showed statistically significant differences between the intervention and comparison catchment areas.

Conclusions:

Use of census track and school level data resulted in intervention and comparison sites comparable on multiple sociodemographic and income variables, as well as food, and physical activity assets. GIS approaches may provide researchers, program evaluators, and policymakers with tools that are useful for determination of community characteristics for both research and practice.

P071

Measuring in-school food/beverage promotions: Reliability of a new electronic tool

Authors:

Lara Latimer, Keryn Pasch

Purpose:

The current study purpose was to investigate the inter- and intra-rater reliability of a new electronic tool to directly measure in-school food/beverage promotion in 30 middle schools.

Methods:

Using FileMaker®, food/beverage promotions (e.g., advertisements, signs, items) were documented by one rater at two time points (to assess intra-rater reliability) and by two raters at one time point (to assess inter-rater reliability). Data were compared to determine overall agreement between each promotion record and between descriptive fields (e.g., quantity, food/beverage type, commercial/noncommercial) within each record. Agreement of ³ 70% between records and between fields within each record was considered acceptable.

Results:

For intra-rater reliability, three middle schools were assessed (m=855 students, 54% Hispanic, 52% male, 57% free/reduced lunch). Average percent of matched records of food/beverage promotions was 95% (range 95-96%). Average percent agreement between individual descriptive fields within each record was 91% (range 87-95%). For inter-rater reliability, six middle schools were assessed (m=826 students, 71% Hispanic, 53% male, 79% free/reduced lunch). Average percent agreement of matched records between the two data collection teams for all schools was 88% (range 73-96%). Average percent agreement between individual fields within each record was 82% (range 76-95%).

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Conclusions:

The new data collection tool showed excellent intra- and inter-rater reliability, indicating that overall food/beverage promotions were consistently documented, as were fields within each record. The electronic tool may be used in future studies to reliably and quickly document food/beverage promotions in schools and other environments in which youth spend time.

P072

Accuracy of the activPAL3™ and activPAL™ activity monitors in measuring stepcount in adults when walking and jogging

Authors:

Ceri Sellers, Philippa Dall, Margaret Grant, Ben Stansfield

Purpose:

The activPAL™ (uni-axial) and activPAL3™ (triaxial) activity monitors (PAL Technologies, Glasgow) are worn on the front of the thigh and measure physical activity in terms of steps (strides) and posture (standing, sitting/lying). Agreement of outcomes between generations of devices must be established for interchangeable use. This study aimed to establish the validity of these monitors in measuring stepcount in adults.

Methods:

Twenty healthy participants were videoed performing pre-determined activities both inside on a treadmill and outside whilst wearing the activity monitors on the right leg. This involved walking (2-5mph), jogging (3.1-9.2mph) and walking up and down stairs. Modified Bland and Altman plots were used to compare the observed video stepcount with monitor records.

Results:

Participants (9M/11F, 19-59y) carried out a median of 1776 steps walking and 441 steps jogging (1 participant abstained from jogging). Both monitors demonstrated a high level of agreement with the video observation for walking: Percentage mean difference between activPAL™ and video was -1.40% (Lower limit of agreement -2.23%, Upper limit of agreement -0.56%) and for activPAL3™ was -1.33% (LLOA -2.74%, ULOA 0.07%). There was a lower level of agreement for jogging: activPAL™ -5.35% (LLOA -16.96%, ULOA 6.27%) and activPAL3™: -13.66% (LLOA -35.20%, ULOA 7.88%). Accuracy for both monitors was lower for participants with a higher jogging cadence.

Conclusions:

The activPAL3™ and activPAL™ monitors showed excellent agreement with video record of stepcount for walking at all speeds. The recording of steps during jogging activities was less accurate, particularly for the activPAL3™ monitor at higher cadences.

P073

SenseCam-coded body positions associated with accelerometer-determined cadence

Authors:

Mahara Proenca, John Schuna, Jacqueline Kerr, Simon Marshall, Catrine Tudor-Locke

Purpose:

To quantify the proportion (%) of time spent in different body positions within incremental bands of accelerometer-determined cadence (steps/min).

Methods:

This was a secondary analysis of SenseCam camera images and ActiGraph GT3X+ accelerometer data concurrently worn during waking hours by 40 adults (70% male; 36±12 years-old; BMI=23±3 kg/m²) for 3-5 days. Body positions coded from images included: 1) sedentary, 2) standing still, 3) standing moving, 4) walking/running, 5) biking, or 6) changing position. For each participant, we calculated the proportion of time spent in each body position within previously published incremental cadence bands: 0 (non-movement during wearing time), 1-19 (incidental movement), 20-39 (sporadic movement), 40-59 (purposeful steps), 60-79 (slow walking), 80-99 (medium walking), 100-119 (brisk walking), and 120+

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steps/min (all faster locomotion). Means and 95% confidence intervals (bootstrapped) were computed to describe the sample-level proportion of time spent in each body position within each cadence band.

Results:

Sedentary behavior was more frequent at lower cadences, M=78% (CI: 72-81%) at 0 steps/min and M=43% (CI: 39-49%) at 1-19 steps/min, and less frequent at higher cadences, M=1% (CI: 0-4%) at 100-119 steps/min and M=1% (CI: 0-3%) at 120+ steps/min. Standing (still or moving), walking/running, biking, and changing position were more frequent at higher cadences, with walking/running most frequently identified, M=71% (CI: 63-79%) at 80-99 steps/min, M=90% (CI: 83-95%) at 100-119 steps/min, and M=87% (CI: 70-95%) at 120+ steps/min.

Conclusions:

Further research is needed to evaluate the validity of cadence as a simple form of pattern analysis for identifying body positions.

P074

Adaptation, reliability, and validity of the Neighborhood Environment Walkability Scale for Youth in Taiwan (NEWSY-T)

Authors:

Ling-Ling Lee, Chia-Feng Yeng, Chi-Fen Tseng, Yi-Liang Kuo, Chu-Ru Lin

Purpose:

To adapt the Neighborhood Environment Walkability Scale - Youth (NEWS-Y) to the context of Taiwan and assessed the reliability and validity of the Chinese version of NEWS-Y.

Methods:

The original NEWSY was translated into Chinese and adapted by a multidisciplinary expert to tailor the built and social environment of Taiwan. Psychometric analyses of the adapted NEWSY-C were conducted on a sample of 246 adolescents from seven junior high schools in different counties of Taiwan, which represents diverse neighbourhood characters. Reliability was tested via both test-retest approach and internal consistency. The validity testing was estimated by examining their construct and concurrent validity.

Results:

All analyses are undertaking and will be reported prior to the ISBNPA conference next May.

Conclusions:

Content will be reported prior to the coming May.

P075

Validation of the automated self-administered 24-hour dietary recall for children (ASA24-Kids) among 9- to 11-year-old youth

Authors:

Cassandra Diep, Melanie Hingle, Tzu-An Chen, Hafza Dadabhoy, Alicia Beltran, Janice Baranowski, Amy Subar, Tom Baranowski

Purpose:

To validate ASA24-Kids-2012, a self-administered web-based 24-hour dietary recall (24hDR) among 9-11-year-old children.

Methods:

Sixty-nine children in two sites participated in the study. In one site, trained staff observed and recorded types and portions of foods and drinks consumed by children (n=38) during school lunch. The next day, participants completed ASA24-Kids-2012 and a dietitian-conducted 24hDR in a randomized order. Procedures in a second site (n=31) were similar, except observation occurred during dinner in a community location. Foods were classified as matches (reported and

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consumed), intrusions (reported but not consumed), or omissions (not reported but consumed) for each participant. Rates of matches, intrusions, and omissions were calculated; for matched foods, we determined correlation coefficients between observed and reported portion sizes.

Results:

Match, intrusion, and omission rates between ASA24-Kids-2012 and observed intakes in site 1 were 32.7%, 29.6%, and 37.8%, respectively. Comparable rates for dietitian-conducted 24hDRs were 54.0%, 21.9%, and 24.1%, respectively. In site 2, match, intrusion, and omission rates between ASA24-Kids-2012 and observed intakes were 52.5%, 12.0%, and 35.5%, respectively, versus 76.0% matches, 9.4% intrusions, and 14.6% omissions for dietitian-conducted 24hDRs. The correlation between reported and observed portion sizes for matched foods was significantly less for ASA24-Kids-2012 than for dietitian-conducted 24hDRs.

Conclusions:

ASA24-Kids-2012 was less accurate than dietitian-conducted 24hDRs when compared to observed intakes, but both performed poorly. More research is needed to assess the age at which children can complete recalls, as well as other factors that might elucidate under which circumstances recalls can reasonably be used in children.

P076

Strategies for recruiting and retaining low-income families in a recreation center-based cardiovascular health promotion program

Authors:

Alberto Florez-Pregonero, Noe Crespo, Sonia Vega-Lopez, Adrian Chavez, Frank Ray, Valentina Hernandez, Monica Gutierrez, Gabriel Shaibi

Purpose:

Few studies report the specific strategies used to recruit and retain low-income participants into cardiovascular health promotion programs. The strategies implemented during a pilot study targeting low-income families (children and their parents) are described herein.

Methods:

The Athletes for Life Program (AFL) was conducted in South-Phoenix, AZ in partnership with a City Recreation Center (CRC) and a Community Clinic (CC). Recruitment strategies, led by our community collaborators, included: 1) A “promotora” contacted patients from the CC, 2) fliers were distributed within/outside the CRC facilities, 3) emphasis on fitness and healthy eating as outcomes rather than weight-loss, 4) AFL was free and all-family inclusive and 5) offered in English and Spanish by bicultural/bilingual staff. Retention strategies were: 1) AFL was held in a CRC within the participant’s neighborhood, 2) use of several incentives to reward attendance (gift-cards for parents, toys for children), 3) AFL created and maintained a family-oriented environment, and 4) a Youth-Olympics event was held to showcase children’s improvements in fitness outcomes.

Results:

Due to high interest, we exceeded our enrollment target (20 children); 37 children and 24 parents enrolled in the program and 32 families were placed on a waiting list. Eighty-seven percent of parents completed the program.

Conclusions:

Recruitment efforts from community collaborators were highly effective and efficient. Reinforcing attendance through several reward strategies, fostering a family-oriented environment, and hosting a Youth Olympics event helped achieve high retention rates. Meaningful and mutually beneficial partnerships with community collaborators are strongly recommended to successfully recruit low-income participants.

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P077

Validity of a self-report survey tool measuring the nutrition and physical activity environment of primary schools

Authors:

Nicole Nathan, Luke Wolfenden, Philip J. Morgan, Andrew Colin Bell, Daniel Barker, John Wiggers

Purpose:

Valid tools measuring characteristics of the school environment associated with the physical activity and dietary behaviors of children are needed to accurately evaluate the impact of initiatives to improve school environments. The aim of this study was to assess the validity of Principal self-report of primary school healthy eating and physical activity environments.

Methods:

Primary school Principals (n = 42) in New South Wales, Australia were invited to complete a telephone survey of the school environment; the School Environment Assessment Tool - SEAT. Equivalent observational data were collected by pre-service teachers located within the school. The SEAT, involved 65 items that assessed food availability via canteens, vending machines and fundraisers and the presence of physical activity facilities, equipment and organised physical activities. Kappa statistics were used to assess agreement between the two measures.

Results:

Almost 70% of the survey demonstrated moderate to almost perfect agreement. Substantial agreement was found for 10 of 13 items assessing foods sold for fundraising, 3 of 6 items assessing physical activity facilities of the school, and both items assessing organised physical activities that occurred at recess and lunch and school sport. Limited agreement was found for items assessing foods sold through canteens and access to small screen recreation.

Conclusions:

The SEAT provides researchers, policy makers and practitioners with an efficient method for assessing the nutrition and physical activity environment of schools.

P078

Web-based delivery of a food frequency questionnaire with food portion images improves dietary assessment results

Author:

Rick Weiss

Purpose:

To demonstrate that a web-based dietary assessment which incorporates food portion images can reliably assess dietary intake with high usability.

Methods:

VioScreen incorporates a new graphical data collection method to reliably assess dietary intake. The tool is a web-based food frequency questionnaire (FFQ) that includes 1,200 food portion size images to help users correctly estimate portion size and algorithms to eliminate errors common on paper forms, such as skipped pages. Results are immediately available and include a food pattern analysis, list of foods and nutrients consumed, and practical, targeted suggestions for food changes.

Results:

Nutrient intake captured by VioScreen was evaluated through an inter-method reliability study with 74 subjects conducted at Ohio State University. Nutrient intake produced by two administrations of VioScreen was compared to intake from six 24-hour recalls. A usability questionnaire was used to survey each subject about their experience with the questionnaire. The inter-method reliability was higher for VioScreen than for the paper FFQ. VioScreen was modeled after and higher than reported for many other paper FFQs used in major epidemiological studies. Of the macronutrients, accuracy only of alcohol values were similar to other questionnaires; for all other components VioScreen correlations were substantially higher, being at or above 0.80 for most macronutrients (0.90 for alcohol, 0.84 for saturated fat, 0.82 for fat, and 0.79 for carbohydrate) and 0.67 for protein.

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Conclusions:

All subjects rated the questionnaire as easy to use, 93% rated VioScreen as either great or excellent, and 99% would complete VioScreen if asked by a doctor.

P079

Wearable cameras can reduce dietary under-reporting: Validation of camera-assisted 24-hr recall against doubly labelled water

Authors:

Luke Gemming, Elaine Rush, Ralph Maddison, Aiden Doherty, Nick Gant, Jennifer Utter, Cliona Ni Mhurchu

Purpose:

Wearable cameras may reduce under-reporting of energy intake (EI) in dietary assessments by revealing unreported foods and reporting errors. We compared EI estimated using a passive wearable camera-assisted 24h recall against that estimated using 24h recall alone and doubly labelled water (DLW).

Methods:

Total energy expenditure (TEE) was assessed over a 15-day DLW protocol. Forty adults (n=20 males and 20 females) wore a SenseCam (SC) wearable camera (automated image capture) in free-living conditions on four days and EI was assessed using three multiple pass 24h dietary recalls (MP24). SC images were viewed after the MP24s and changes to self-reported intakes were recorded. TEE and EI assessed by MP24 and MP24+SC, and EI from MP24 and MP24+SC, were compared.

Results:

Among men (35±17 yrs, BMI = 27±8 kg/m²), MP24 (12,004 KJ) and MP24+SC (13,196 KJ) underestimated TEE (14,485 KJ) by 17% and 9%, respectively (P<0.001 and P=0.02). EI following MP24+SC was 8% higher than MP24 (P<0.001). Among women (28±7yrs, BMI = 22±2 kg/m²), MP24 (9,420 KJ) and MP24+SC (10,091 KJ) underestimated TEE (10,841 KJ) by 13% and 7%, respectively (P<0.001 and P=0.004). EI following MP24+SC was 6% higher than MP24 (P<0.001). Technical limitations of SC used for dietary assessment were apparent.

Conclusions:

Wearable cameras significantly reduce under-reporting in the 24h dietary recall. Faster imaging frequencies (<1s) and high definition image sensors may improve the accuracy of camera-assisted dietary assessment further.

P080

Researchers connecting with practitioners

Author:

Jamie Moody

Purpose:

A case study involving IBACH (research institute) and the YMCA Childcare Resource Service (child care practitioner) through their involvement in the San Diego County Childhood Obesity Initiative (COI) Early Childhood Domain resulted in an assessment of the eating and physical activity practices of child care teachers in San Diego. Very few research and practitioner partnerships occur outside of funded research studies. Researchers need to understand how to work with practitioners to make a research connection that makes sense for them.

Methods:

This case study will describe the benefits and challenges of and recommendations for researcher and practitioner partnerships. Data are derived from researcher and practitioner interviews. In addition a survey of eating and physical activity practices was conducted with 131 child care teachers throughout San Diego County, CA, to identify COI Early Childhood Domain eating and physical activity priority areas.

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Results:

Results of the child care survey demonstrated that San Diego County child care teachers eating and physical activity practices were consistent with the results of a statewide study; findings demonstrated a need for tools and resources to incorporate more physical activity opportunities. Practitioners may benefit from partnerships with researchers by implementing evidence-based practices. Researchers need to 'connect' with practitioners in a way that makes the research process appealing to implement.

Conclusions:

The findings of this case study provide an opportunity to inform researchers how to better link research with community partnerships.

P081

Evaluation of a short fat behavior scale for low-literate Spanish speakers

Authors:

Daniela Gonzalez-Quezada, Jinan Banna, Marilyn Townsend

Purpose:

The aim of this study was to evaluate the usefulness and limitations of six items on a food behavior checklist related to fat intake in low-literate Spanish speakers.

Methods:

Participants (n=82) completed three dietary recalls and six fat intake items such as 'take skin off chicken,' 'eat fast food yesterday,' and 'eat fish during past week.' Factor structure was examined using principal component analysis. Spearman correlation coefficients between nutrient intakes from recalls and fat behavior scores were calculated, with higher scores indicating more favorable behavior. Cronbach's α coefficient indicated internal consistency.

Results:

Factor analysis revealed more than one factor. While red meat and fast food intake did not load on any factor, 'fish' and 'skin off chicken' loaded together ('healthful' subscale), as did 'fried food' and 'fried snacks,' ('energy dense' subscale). A significant correlation was found between 'healthful' subscale scores and recall fat intake ($r = -0.2$). Total fat behavior scores were also significantly correlated with recall fat intake ($r = -0.3$). The internal consistency for the six items was 0.34.

Conclusions:

Results revealed two dimensions of fat intake, and two items, 'red meat' and 'fast food,' for potential elimination. Low internal consistency indicated items did not perform as one scale, or additional items representing other fat behaviors are needed. Similarly, lack of correlation with recall variables may indicate that items did not capture all relevant fat-related behaviors in this population. Additional qualitative testing of existing items' photos and text and/or development of additional items related to fat intake is recommended.

P082

Validation of an online instrument for assessing eating and physical activity behaviors in young adolescents

Authors:

Dalia Majumdar, Pamela Koch, Heewon Lee, Isobel Contento

Purpose:

To validate a 41-item, self-administered, online instrument that measured selected eating and physical activity behaviors pertinent to energy balance among middle-school adolescents (Grades: 6-8).

Methods:

This cross-sectional study used data of 507 middle-school adolescents (Age: 11-13yrs, 50%-males, 65%-Hispanics from low-income neighborhoods in New York City) who completed the instrument in approximately 15-20 minutes, prior to a video game intervention in their science/computer classrooms. The instrument was developed in SurveyMonkey and

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measured frequencies and amounts/time spent on selected food (sweetened beverages, water, processed snacks, fruit and vegetables), and physical activity (sedentary, light, moderate and intense) behaviors. It consisted of colored pictures to enhance understanding and facilitating comprehension of text. Mean readability score was 3.7 ± 1.2 . The items and scales included were based on two prior empirical testing. Data were analyzed to determine convergent validity (Pearson-r) by comparing scales within the survey, and reliability by examining internal consistency (Cronbach-a). A sample of similar adolescents (n=25) was recruited for examining criterion validity (Pearson-r) by comparing with other validated instruments, and test-retest (7-days later, Intra-class correlations) reliability.

Results:

Convergent validity for behaviors ranged from 0.16-0.53 (median-0.28). Cronbach-a scores were 0.5-0.8 (median-0.75). Criterion validity for food frequency items ranged from 0.21-0.64 (median-0.43), food amount items between 0.18-0.93 (median-0.72), and between 0.13-0.46 (median-0.29) for all activity items. Test-retest correlations for all items ranged between 0.02-0.94 (median-0.58).

Conclusions:

This online instrument may be used as a valid and reliable measure for assessing selected eating and physical activity behaviors among adolescents. However, selected scales warrant further validation.

P083

Validation of the California Health Interview Survey dietary screener for youth

Authors:

Veronica Irvin, Ashley Hyman, Katy Schmitz, Samuel Liles, Sheila Jackson, Melbourne Hovell

Purpose:

To assess validity of the California Health Interview Survey (CHIS) dietary screener among youth. CHIS recalls six food types: 100% juice, fruit, vegetables, French fries, sugar-sweetened beverages (SSB) and sweets.

Methods:

Youth (8-14) completed 3 prior-day recalls with the CHIS screener (n=552). A random sub-sample (7%, n=41) completed additional 24-hour dietary recalls with NDS. Validity was assessed by 1) confirmation with parent and 2) 24-hour recall. Sub-sample demographics were 56% female, 51% <12 years, 17% Hispanic, 59% NH-White. Percent agreements, kappa coefficients and correlations were run on dichotomized (any or none) and log-transformed intake values.

Results:

Among the full sample, agreement between child/parent was high (81%-95% dichotomous agreement; Pearson $r=0.84-0.91$). Vegetables had the lowest agreement. Agreement with parent report was stronger among girls and youth age 12+ than boys and younger children. Among the sub-sample, CHIS produced over-estimates of juice, fruit, and fries and under-estimates of vegetables, SSB and sweets as compared with dietary recall. Five of the foods had strong percent agreements (73-89%) with significant kappas and correlations. Recall of vegetable intake was poor (59% agreement; kappa=.10, $p=0.045$). Agreement for vegetable intake was poorest for boys and children <12 years, resulting in null kappa statistics. As with validation with parent's report, girls and children 12+ had stronger agreements and correlations for most variables.

Conclusions:

Youth's CHIS responses agreed well with their parents' and values captured by 24-hour dietary recall. Investigators should be cautious with youth's recall of vegetable intake, especially among boys and children <12 years.

P084

Optimization of daily physical activity monitoring in adolescents: The use of ActiTrainer accelerometer

Authors:

Frantisek Chmelik, Karel Fromel, Lukas Jakubec, Zbynek Svozil, Roman Cuberek, Dorota Groffik, Petr Valach

Purpose:

Limitations in monitoring of physical activity (PA) call for the application of triangulation approaches. The goal of the study is to present a verified triangulation approach to monitor daily PA in adolescents on an example of selected characteristics of PA and to suggest how to interpret the data more accurately.

Methods:

The sample consisted of 868 girls and 409 boys (15-17 years old). Daily PA was monitored by ActiTrainer accelerometers (simultaneously monitors PA and heart rate (HR)) and using subjectively reported PA and physical inactivity (PI) daily logs (specifying its duration and type). School days were segmented into periods: Before school, separate lessons, separate recesses, total school time, and after school.

Results:

The total daily volume of PA was characterized by 691 ± 241 steps/hour in girls (688 ± 271 boys) and by 0.46 ± 0.20 kcal/kg/hour (0.52 ± 0.25 boys). Duration of MVPA (≥ 3 METs) was 4.63 ± 2.51 min/hour in girls (5.47 ± 3.02 boys) and duration of MVPA ($\geq 60\%$ HRmax) was 5.58 ± 5.31 min/hour (4.75 ± 5.03 boys). The ratio of PI/PA was 1.75 ± 0.32 in girls (1.73 ± 0.37 boys) which comprised 34.3% (35.2% boys) of the duration of any PA out of the accelerometer wear time. In all the above mentioned characteristics, the volume and intensity of PA was significantly higher ($p < 0.001$) in the before school period as compared to the other periods.

Conclusions:

It is reasonable to set minimal and maximal duration of individual monitored segments of a day and to convert the characteristics of PA into a relative values per hour of monitor wear time within the segments.

P085

Validity of an app for observing play and recreation in communities (iSOPARC) to determine target areas

Authors:

Maria Paula Santos, João David, Roseanne Autran, Jorge Mota, Rodrigo Reis, Cassiano Rech

Purpose:

The development of high-quality measures is essential to improve the understanding about influence of the built environment on physical activity. The System for Observing Play and Recreation in Communities (SOPARC) is an appropriate tool to evaluate physical activity in urban parks and other public open spaces for physical activity. iSOPARC® is an app developed for iPad® devices aiming to optimize data collection. The application also enables the identification of Target Areas by mapping them and by calculating their size automatically. The aim of this study is to examine the validity of the calculation of the target area obtained through the application.

Methods:

Repeated measures of 18 Target Areas were taken with the iSOPARC® and with a GPS Garmin Oregon 550 T. iSOPARC® uses the ArcGIS SDK algorithm to estimate the polygon's area. After drawing the irregular geographic surface, iSOPARC® projects the polygon using the WGS94 Spatial Reference - Cylindrical Equal Area (WKID: 53034). Size is estimated in squared meters. Repeated measures of each method were compared. Intraclass Coefficient Correlation within measures and between two methods was calculated.

Results:

Repeated measures with iSOPARC® were highly correlated ($ICC = 0.997$; $p < 0.001$). Mean and standard deviations of measures taken with iSOPARC® did not differ from GPS measures and methods are highly correlated ($ICC = 0.993$; $p < 0.001$).

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Conclusions:

In addition to the standard observational data collect on people and park areas, results support the use of iSOPARC® app as a valid method to determine Target Areas selected to observe physical activity within parks. Supported by PTDC/DES/111807/2009; FCOMP-01-0124-FEDER-014697.

P086

Comparison of postural classification from thigh-worn Actigraph GT3X+ and ActivPal3 accelerometers under laboratory and free-living conditions

Authors:

Jeremy Steeves, Heather Bowles, James McClain, Kevin Dodd, Robert Brychta, Juan Wang, Kong Chen

Purpose:

This study compared sitting, standing, and stepping classifications from thigh-worn Actigraph and ActivPAL monitors under laboratory and free-living conditions.

Methods:

Adults wore both monitors on the right thigh while performing 6 sitting, 2 standing, 8 stepping, and 1 cycling activity under laboratory observation (n=21), and during three days free-living (n=18). Percent of time correctly classified into postures was calculated under laboratory conditions. Between-monitor percent agreement and weighted kappa were calculated under free-living conditions.

Results:

In the laboratory, both monitors correctly classified 100% of time in standing activities and >95% of time in four sitting activities. Both monitors demonstrated substantial misclassification of laboratory stool sitting (Actigraph 14%, ActivPAL 95%), and ActivPAL (14%) misclassified sitting with legs outstretched more often than Actigraph (0%). Actigraph misclassified more time spent descending stairs (14%) and ascending stairs (8%) than ActivPAL which correctly classified >95% of time in all stepping activities. The ActivPAL classified cycling as stepping 93% of time, but the Actigraph classified cycling as stepping <1% of time. During free-living wear, Actigraph and ActivPAL data matched second-by-second had high observed agreement (86%) and substantial agreement when accounting for chance (weighted kappa=0.77). The levels of agreement are due primarily to the relatively high volume of time recorded as sitting (Actigraph 64%, ActivPAL 62%), but there were differences in time recorded as standing (Actigraph 21%, ActivPAL 27%), and stepping (Actigraph 15%, ActivPAL 11%).

Conclusions:

Differences in data processing algorithms based on thigh angle may have resulted in disagreement in posture classification between thigh-worn Actigraph and ActivPAL.

P087

Assessing sugary beverages using FoodBEAMS, a web-based tool: Baseline findings from the California CTG program (CA4Health)

Authors:

Sallie Yoshida, Sole Drago-Ferguson, Alison Newton, Katherine Hawksworth, Kate Cheyne, Diane Barker

Purpose:

CA4Health is a 5-year Community Transformation Grant from CDC. One goal is to reduce the consumption of sugary beverages in 12 low income counties. The multi-method evaluation of CA4Health included FoodBEAMS, a unique web-based assessment tool to document the availability of beverages. Typically used in school settings, FoodBEAMS was used to capture the beverage environment in settings such as adult setting, non-school youth sites, worksites and settings with children 0 - 5.

Methods:

Community leaders were trained via webinar to use FoodBEAMS to catalogue beverages in intervention settings. The type, size, price of beverages, and promotional information were entered into the FoodBEAMS website using an iPad

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which links to an extensive database of >1,800 beverages. Adherence to 4 model beverage standards was then determined.

Results:

Data was collected from 91 sites and >4,313 beverages were assessed. The most common beverages were soda (22%), water (14%), and sports drinks (13%). Overall, across all settings, 69% of the beverages did not adhere to the beverage standards. For specific beverages, adherence for milk was 25% (due to the presence of flavored milk and higher fat milk) and adherence for 100% juice was 20% (due to serving sizes larger than the standards allowed).

Conclusions:

Beverage environments need improvement. While challenging, community leaders have demonstrated their capacity to assess the beverage environments using FoodBEAMS. Findings demonstrate that data collected from FoodBEAMS can be used by practitioners to build relationships, guide interventions, and increase communication among partners.

P088

The Determinants of diet and physical activity (DEDIPAC) knowledge hub: Towards the integration and development of a cross-European research network and infrastructure

Authors:

Jeroen Lakerveld, Hidde van der Ploeg, Pieter van 't Veer, Nanna Lien, Ilse De Bourdeaudhuij, Johannes Brug, On behalf of the DEDIPAC Consortium

Purpose:

To address the major societal challenges and enhance cooperation in research across Europe, the European Commission has initiated and facilitated 'joint programming'. This joint programming is a process by which Member States engage in defining, developing and implementing a common strategic research agenda, based on a shared vision of how to address major societal challenges that no Member State is capable of resolving independently. The Determinants of Diet and Physical Activity (DEDIPAC) Knowledge Hub (KH) is the first action of the European Joint Programming Initiative (JPI) 'A Healthy Diet for a Healthy Life'. The objective of DEDIPAC is to contribute to improving the understanding of determinants of dietary, physical activity and sedentary behaviors. DEDIPAC KH is a multi-disciplinary consortium of scientists from 46 research centres supported by joint programming grants from 12 countries across Europe.

Methods:

In the initial three years DEDIPAC KH will develop, exchange, harmonize and share expertise, methods, measures, data and other infrastructure. This will be done in order to enable a broad multidisciplinary approach, including biological, ecological, psychological, sociological, and economic determinants and their interrelationships. These insights will be translated into more effective promotion of healthy dietary, physical activity and sedentary behaviors.

P089

Connecting partners around BeweegKuur alliances: Successes and challenges

Authors:

Franciska Hartog, den, Annemarie Wagemakers, Lenneke Vaandrager, Liesbeth Preller, Maria Koelen

Purpose:

This study explored the successes and challenges of collaboration processes in BeweegKuur alliances. The BeweegKuur (Exercise Therapy) is a Dutch lifestyle program in which patients are referred by a general practitioner to a lifestyle advisor, who in collaboration with a dietician and physiotherapist coaches participants in achieving healthier lifestyles, following a protocol. The ultimate goal is to transfer participants to local sports facilities in order to achieve sustainable behavioral change. To support implementation of the program and transition of participants to sports facilities, 30 regional and 150 local alliances were established throughout the Netherlands.

Methods:

Based on the Healthy Alliances (HALL) framework, interviews were held with coordinators of 13 regional and 20 local alliances and focus groups were held with 7 regional and 17 local alliances from 2010 - 2012.

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Results:

Collaboration within alliances was perceived to be successful in integrating prevention and care. Results of the Be-weegKuur, such as improved health of participants, and results of the alliance, such as multidisciplinary contacts, provided energy to continue collaboration. Challenges are the participation of the municipality and sport sector and the limited transition of participants to local sports facilities. Alliances in which a variety of sectors are involved, are more successful, especially when a broker role is fulfilled to connect primary care and sports facilities.

Conclusions:

General conditions for successful collaboration are: Flexible protocols and management that allow for contextual adaptation, making successes and challenges visible, time to overcome culture differences between different sectors and active brokering between partners.

P090

Limitations in the detection of stepping at very slow speed using the activPAL3 activity monitor

Authors:

Ben Stansfield, Mugdha Hajarnis, Radhika Sudarshan

Purpose:

Clinical populations may walk at very slow speeds. To quantify the volume of stepping activity it is necessary to have a validated device. The activPAL3 is a physical activity monitor with a demonstrated validity of step measurement. However, there is limited evidence of the monitor's validity at very slow speeds (i.e. below 0.5m/s). An assessment of the monitor's ability to detect stepping activity in healthy adults between 1.0 and 0.1m/s was performed.

Methods:

An activPAL3 (PALTechnologies, UK) was worn (front of the thigh) by 20 adults (10M/10F, 36±10y) whilst undergoing a treadmill walking protocol with speeds increasing (x2) and decreasing (x2) between 1.0 and 0.1m/s in 0.1m/s increments. Video-based step count of 20s segments at each speed were used as the criterion measure in comparison to the activPAL3 stride count multiplied by 2. All 800 (20 participants x 10 speeds x 4 repetitions) walks were examined by speed. The mean apparent percentage of steps accurately detected at each speed was calculated.

Results:

At 0.6m/s (76±9steps/min) 93±12% steps were detected. At slower speeds the % steps detected fell: 0.5m/s (69±9steps/min) 82±23%; 0.4m/s (60±11steps/min) 62±34%; 0.3m/s (51±12steps/min) 36±34%; 0.2m/s (41±14steps/min) 23±32%; 0.1m/s (27±17steps/min) 6±20%.

Conclusions:

The apparent percentage of steps detected reduced rapidly below 0.4m/s suggesting a limitation in use of the device. However, the applicability of the results generated from a treadmill protocol in a healthy population to the free-living stepping activity of clinical populations remains to be established.

P091

Accelerometer data reduction: A comparison of reduction algorithms with three ActiGraph analysis] software packages

Authors:

Veronica Cabanas-Sanchez, Laura Garcia-Cervantes, Rocio Izquierdo-Gómez, Oscar L Veiga

Purpose:

The aim of this study was to compare common reduction algorithms for ActiGraph accelerometer data using three software packages in order to identify their impact on the number of subjects with valid data.

Methods:

200 adolescents from the UP&DOWN Study wore the GT1M and GT3X ActiGraph accelerometers during 7 days. Data were processed applying eight data reduction algorithms with three software packages (i.e. Actilife, Meterplus, and

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Propero). Sixty minutes of continuous zeros were used to define non-wearing time. Algorithms 1 to 4 required four valid days, whereas algorithms 5 to 8 required three valid days. Algorithms 2, 4, 6 and 8 also required at least one weekend day. Algorithms 1, 2, 5, and 6 defined a valid day as having accelerometer data for ten hours while algorithms 3, 4, 7, and 8 for eight hours. Percentages of valid cases were calculated and the McNemar test was used to determinate differences between software outputs.

Results:

Significant differences were found between Actilife and Propero for all algorithms ($P < 0.001$) with the exception of the algorithm 7. We also found significant differences in the results derived from Meterplus and Actilife in all algorithms ($P < 0.05$). Significant differences between Propero and Meterplus for algorithms 1, 2, 6 and 8 were found ($P < 0.05$) whereas no differences were found for the rest of algorithms.

Conclusions:

Choice of the ActiGraph analysis software may have an important impact on the number of subjects with valid data, consequently in subsequent analyses and potentially in study results.

P092

Rationale and development of individual counseling based on self-determination theory and motivational interviewing

Authors:

Linus Jonsson, Magnus Lindwall, Karin Weman-Josefsson

Purpose:

In a recent published article series in International Journal of Behavioral Nutrition and Physical Activity a marriage between Self-Determination Theory (SDT) and Motivational Interviewing (MI) was proposed. The purpose of the present paper is to describe the rationale and development of individual counseling, based on the tenets of SDT and techniques drawn from MI, used to promote exercise adherence.

Methods:

A review of the literature relevant to the marriage of SDT and MI was conducted, and a counseling approach based on SDT and MI progressed. Guidelines for how to support individuals basic needs in individual counseling and scripts for individual counselling sessions to promote exercise adherence was developed.

Results:

To support the individuals need for autonomy, competence and relatedness different techniques and approaches was proposed. The counseling technique is now being tested in a randomized control intervention (intervention group ($n=50$), control group ($n=50$)) to promote regular exercise among healthy, inactive adults.

Conclusions:

This paper outlines the rationale and development of individual counseling based on SDT and MI. Although a 'complete marriage' between SDT and MI may not be possible, an initial step towards a 'new' counseling approach has been made.

P093

Associations between PA and healthy diet knowledge, professional practice and behaviors among community health workers in Brazil

Authors:

Alex A Florindo, Gregore I Mielke, Grace A O Gomes, Diana C Parra, Eduardo J Simoes, Felipe Lobelo, Michael Pratt, Pedro C Hallal

Purpose:

To verify the associations between knowledge, professional practices, and behaviors related to physical activity and healthy diet among Brazilian Community Health Workers.

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Methods:

A cross sectional study was completed as part of the GUIA project in Brazil, including a random digit-dialing telephone survey with 347 professionals working in the primary health care system in Brazil (89.2% women; mean age of = 36 years; 87.4% with 12 years of education). Knowledge of the following was evaluated: 1) Fruit and vegetable consumption (5 portions/day); 2) promotion of moderate physical activity (30 minutes/5 times per week) and vigorous physical activity (20 minutes/3 times per week). The behaviors evaluated were: 1) Fruit and vegetable consumption (5 portions/day); 2) practice of physical activity (at least 150 minutes per week of transportation or leisure time). Professional practice toward physical activity counseling were assessed (regular practice of counseling). Associations were calculated by logistic regression (odds ratio, OR) and adjusted by sex, age and education.

Results:

Accurate knowledge about fruit and vegetable consumption was associated with consuming fruits and vegetables (OR=4.58 95%CI=1.05;20.01). Physical activity counseling was associated with physical activity practice (OR=4.90 95%CI=1.44;16.70).

Conclusions:

Professional knowledge and practices related to physical activity and diet are associated with healthy behaviors in Community Health Workers. These results suggest that interventions to improve diet and physical activity knowledge, attitudes and behaviors are merited in Community Health Workers in Brazil.

P094

Associations of exercise behaviors and habits with implicit attitudes: Comparing exercise-specific and generic wordings in an Implicit Attitude Test

Authors:

Gert-Jan de Bruijn, Frank Eves

Purpose:

Unconscious processes of exercise behavior and habits may be better captured using implicit measures instead of survey-based measures. Most research on implicit attitudes and exercise behaviors has used generic wordings for both target blocks of exercise behavior (e.g. sport) and attribute blocks (e.g. peace). These words may not capture specific attributes for specific exercises. The present study was designed to understand the interplay between exercise behavior, habits, and implicit attitudes assessed using standard and exercise-specific implicit attitude tests (IAT).

Methods:

Data were collected in a convenience sample (n=86, 40.7% male, Mage=23.3), who had exercised at least once in the previous month. The standard IAT was constructed based on previous studies, whereas the exercise-specific IAT was constructed based on pretests and expert discussions. The IAT order was randomized across participants. After completing the IATs, participants provided information on their specific exercise habits, behavior and affective attitudes. Data were analyzed using correlational and regression statistics, controlling for exercise type.

Results:

Mean exercise behavior in the previous four weeks was 141.9 (SD=117.1) minutes. Habit and implicit attitude scores were around midscale, affective attitude scores were positive. There was a small-effect sized correlation between the two IATs ($r=.30$). For the exercise-specific IAT, there were nonsignificant associations with exercise habit ($r=.14$), behavior ($r=-.02$), and affective attitude ($r=-.02$). A similar pattern was observed for the generic IAT, showing nonsignificant associations with exercise habit ($r=.06$), behavior ($r=-.03$), and affective attitude ($r=.01$).

Conclusions:

Assessing implicit associations of exercise behavior is problematic when using either general IATs or behavior-specific IATs.

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Determining whether geographic information systems or self-reported perceived access data are a better measure for estimating the effect of F&V access on intake

Authors:

Lindsey Haynes-Maslow, Lucia Leone, Alice Ammerman, Stephanie Bomberger, Mark Holmes, Barbara Mark

Purpose:

To compare the predictive power of geographic information system (GIS) measures versus self-reported perceived-access measures for estimating the effect of fruit and vegetable (F&V) access on intake.

Methods:

This study uses data from the NC Green Carts Survey and ReferenceUSA. The NC Green Carts Program is a F&V intervention that coordinates, distributes and sells F&V in low-income communities. Participants completed a survey about access to F&V, diet, demographics, and home address. 115 low-income participants in 6 sites across 3 counties were included in this study. ReferenceUSA, a website with real-time access to U.S. businesses, was used to download addresses to grocery and convenience stores. Researchers calculated the number of food outlets within 1-mile of participant's home. Two Poisson regression models were used to calculate the predictive power of the GIS-based model and the perceived-access model. Perceived-access was a 3-item measure using convenience, quality, and variety of fresh F&V. Model fit was based on Akaike Information Criterion (AIC) and pseudo-R².

Results:

Based on Model 1, food outlets less than 1 mile from a participant's home, an increase in grocery stores was associated with an increase in F&V intake ($p < .05$). An increase in convenience stores was associated with a decrease F&V intake ($p < .10$). For model 2, the perceived-access model, increasing perceived access was associated with a decrease in F&V intake, however, this was statistically insignificant. Based on AIC and pseudo-R² the GIS-measures had the best model fit.

Conclusions:

GIS-based measures have more predictive power than perceived access measures in estimating access on intake.

P096

Effectiveness of commercially provided 'green exercise' space as enablers of sustained health behavior change - a preliminary focus group study

Author:

Natalie Connor

Purpose:

There is limited research that supports the idea that any type of green exercise is effective. There is however, a growing interest in the potential of allotments and community gardens to promote physical activity, healthy eating and positive mental health¹. The focus of this study was to understand the attitudes and opinions of local communities with regard to community allotments and gardens within County Durham. This is a precursor to the main study which will investigate the delivery of a physical activity intervention called 'Active Growing.'

- Explore the needs of local communities in terms of setting up an allotment programme.
- Establish appropriate, feasible and acceptable data collection methods for the future study.

Methods:

This was an exploratory study using focus groups within a community setting. Three focus groups had 6-8 participants (20 participants in total). Focus groups lasted up to 90 minutes and were audio recorded for analysis. Focus group sessions were transcribed before undergoing a thematic analysis².

Results:

A thematic analysis identified overarching themes across all groups, suggesting the key themes that needed to be addressed when developing a physical activity intervention such as 'Active Growing' are 'Development of a Community Garden,' 'Recruitment,' and 'Barriers to Participation.'

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Conclusions:

The findings from the focus groups have enabled the development of a physical activity intervention called 'Active Growing.' Following on from this preliminary focus group study, the next stage will be rolling out 'Active Growing' across three sites in County Durham.

P097

A randomised crossover trial to assess the effects of three different screen-based sedentary behaviors on energy intake in children: A laboratory study

Authors:

Samantha Marsh, Cliona Ni Mhurchu, Yannan Jiang, Ralph Maddison

Purpose:

Evidence from laboratory studies suggests that TV watching increases energy intake (EI) in children; however, little is known about the comparative effects of different screen-based sedentary behaviors, and no studies have investigated the effects of recreational computer use. An experimental study was conducted to compare the effects of three popular screen-based sedentary behaviors on acute EI in male children.

Methods:

Normal-weight males aged 9-13 years participated in a randomised crossover trial conducted in a laboratory setting. EI from an ad libitum meal was compared during three 1-hour conditions: (1) TV watching, (2) sedentary video game (VG) play, and (3) recreational computer use. All food advertising and food-related content was removed from the TV condition. The primary endpoint was total EI from food and drink. Mixed regression models were used to evaluate the treatment conditions adjusting for age, BMI, and appetite at baseline.

Results:

Twenty participants were randomised and completed the three conditions. Total EI from food and drink (primary endpoint) in the TV, computer, and VG conditions was estimated at 820 (SE 73.15), 685 (SE 73.33), and 696 (SE 73.16) kcal, respectively. Total EI was significantly greater in the TV versus computer condition (+135; $p=0.04$), was somewhat greater in the TV versus VG condition (+124; $p=0.06$), but did not differ significantly between the computer and VG conditions (-10 kcal; $p=0.87$).

Conclusions:

TV watching increased EI compared with computer use and, to a lesser extent, VG play. All three activities were associated with substantial energy intake during a 1-hour period.

P098

Nutrition self-efficacy is unidirectionally related to outcome expectations in children

Authors:

Andrew Larsen, John McArdle, Trina Robertson, Genevieve Dunton

Purpose:

This work uses longitudinal cross-lagged path analysis to determine the direction of this relationship (unidirectional vs. bidirectional) between nutrition self-efficacy and nutrition outcome expectations because it is debated in the literature.

Methods:

Secondary data analysis of a randomized controlled 10-lesson school-based nutrition education intervention among 952 3rd grade students. Student self-reported nutrition self-efficacy and nutrition outcome expectations were assessed at pre-intervention and post-intervention. A series of two-time-point, multi-group cross-lagged bivariate change-score models were tested using Structural Equation Modeling (Statistical Program R) to determine the direction of the relationship.

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Results:

A cross-lag from pre-intervention self-efficacy predicting changes in post-intervention outcome expectations significantly improved the fit of the model (change-in- $\chi^2 = 48.44$, change-in-degrees of freedom = 2, $p < .001$), whereas a cross-lag from pre-intervention outcome expectations predicting changes in post-intervention self-efficacy only slightly improved the fit of the model (change-in- $\chi^2 = 6.92$, change-in-degrees of freedom = 2, $p = .03$). Furthermore, adding both cross-lags did not improve model fit compared to the model with only the self-efficacy cross-lag (change-in- $\chi^2 = 4.23$, change-in-degrees of freedom = 2, $p = .12$). Lastly, the pre-intervention outcome expectations cross-lag did not predict changes in post-intervention self-efficacy in any of the models ($p > .05$).

Conclusions:

Data suggest that there is a unidirectional relationship between nutrition self-efficacy and nutrition outcome expectations, in which self-efficacy predicts outcome expectations. Therefore, theory-based nutrition interventions with limited resources may consider focusing more resources for targeting self-efficacy because increasing self-efficacy may lead to increases in outcome expectations.

P099

Somali, Latino & Hmong “Radio Stories” about children’s healthy eating and exercise: A SoLaHmo pilot study

Authors:

Chrisa Arcan, Kathleen Culhane-Pera, Shannon Pergament, Khalid Adam, Xai Gao Sheng Chang, Naima Dhere, Hodan Dualeh, Beatriz Torres

Purpose:

Following a Community-Based Participatory Research approach, three “Radio Stories,” an entertainment health education tool, were developed to inspire Somali, Latino, and Hmong families to make healthy lifestyle changes to prevent type 2 diabetes.

Methods:

Three linguistically and culturally-appropriate “radio stories” were developed by interviewing families who had successfully managed their diabetes through lifestyle changes. To test the effectiveness and acceptability of “radio stories,” 123 participants (43 Hmong, 40 Latino, 40 Somali) were randomized to intervention (listened to “radio stories”) and control (listened to audio-taped brochures of relevant health information). Intentions to engage in healthy lifestyle behaviors (16 items) were measured pre and post. Mixed-model analysis of variance was used to examine the intervention effect (net difference) for each survey item.

Results:

At baseline, more than 60% of participants reported strong intentions to engage in healthful dietary and physical activity behaviors. Somali and Latino participants were more likely to improve intentions after listening to “radio stories”, whereas Hmong participants were more likely to improve intentions after listening to the brochure. After listening to the radio story, Somalis improved their intention to reduce family intake of sugary drinks ($p = 0.056$) and fast-food ($p = 0.0045$), and increase intake of healthy grains ($p = 0.007$), while Latinos improved their intention to manage their stress ($p = 0.039$). No statistical significance was found on survey items for Hmong participants.

Conclusions:

“Radio stories” can be an effective health education method especially among Somalis and Latinos. It could potentially be used for other health conditions and in various health settings.

P100

Are staff aware of child care center nutrition policies?

Authors:

Amber Vaughn, Temitope Erinosh, Kamaria Mason, Dianne Ward

Purpose:

Center-level nutrition policies help guide the foods served and feeding environment at child care, and thereby impact children’s dietary intake. However, staff must be aware of policies in order to enforce them.

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Methods:

The Environment and Policy Assessment and Observation protocol (EPAO, self-report version) was administered at 50 North Carolina child care centers. Directors completed surveys about center demographics and the presence of center nutrition policies. Two preschool teachers from each center completed a questionnaire about their awareness of these policies. Percent agreement between director and staff reports were calculated in SAS v.9.2.

Results:

According to directors, most all centers had policies on: Serving healthy foods (96%) and limiting unhealthy foods (88%), encouraging new and cultural foods (96%), informal nutrition education for children (96%), role modeling of healthy eating (94%), prompting children to drink water (94%), child feeding (90%), celebration foods (90%), and not using food as punishment (88%). Most staff were aware of these policies (range: 62.5-94.8%). Slightly less common policies included: Use of non-food items for celebrations (78%), nutrition education for children (78%), and staff nutrition training (72%). Staff awareness of these policies was slightly lower (range: 61.0-68.1%). The least commonly reported policies were: Foods brought in by staff (69%), family style dining (66%), and use of food as a reward (65%). Staff awareness of these policies varied (range: 20.6-83.8%).

Conclusions:

Center adoption of nutrition policies appears to be well-translated to staff; although, additional research is needed to link presence and awareness to promotion of healthy eating.

P101

Perceptions of food availability is associated with healthy and unhealthy snacking among urban youth

Authors:

Meg Bruening, Punam Ohri-Vachaspati

Purpose:

To assess the relationship between perceived food availability and healthy/unhealthy snacking behaviors across childhood. Snacking is an understudied behavior associated with positive overall dietary intake. Findings will provide information on factors related to snacking.

Methods:

As part of the New Jersey Child Health Study, parents (n=1176) from four New Jersey cities reported children's (mean age=10.5±4.5; 48.5% female) eating behaviors, food availability, and other obesity-related factors via a telephone survey. Multiple logistic regressions were used to assess associations between children's fruit/vegetable and sweet/salty snacking and parent's perception of availability of 1) fruits/vegetables and 2) low-fat foods in stores where they did most of their food shopping. Models were stratified by child's age (pre-school-ages 3-5, elementary-ages 6-11, and middle/high school-ages 12-18) and adjusted for child gender, race/ethnicity, mother's education, household income, and parent US-born status.

Results:

On average, children consumed 0.8±.9 fruit/vegetable and 0.8±1.0 sweet/salty snacks per day. Fruit/vegetable and sweet/salty snacking were not highly correlated (r=0.07). There was a significant association between perceived low-fat food availability and fruit/vegetable snacks consumption for elementary (OR=1.34; p=0.020) and middle/high school students (OR=1.33; p=0.031). Low-fat food availability was also inversely associated with sweet/salty snacks for elementary school participants (OR=0.78; p=0.47). Parents' perceptions of fruit/vegetable access was only associated with fruit/vegetable snacking for elementary-aged children (OR=1.34; p=0.031). There were no associations between healthy and unhealthy snacking and food availability for preschoolers.

Conclusions:

Perceptions of healthier food environments was related to higher odds of healthier snacking for most youth. Public health efforts to promote healthier food environments are needed.

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A family matter: Assessing cultural attitudes and practices related to weight status of children enrolled in Family Child Care Homes

Authors:

Ana Lindsay, Judith Salkeld, Faith Sands

Purpose:

About 41% of American preschool children are placed in care settings, such as Family Child Care Homes (FCCHs), for thirty-five or more hours weekly. These venues have great potential for promoting early behaviors significantly related to healthy growth. Given that childhood obesity rates are highest among non-white populations, we focus on Latino FCCH providers and children in their care to explore interpersonal and organizational influences on eating and physical activity patterns of young children.

Methods:

This work expands upon previous research findings revealing an influential role of childcare settings on young Latino children's eating and physical activity behaviors. We employed a combination of qualitative methods, including policy analysis, in-depth interviews with key informants, and focus groups regarding preschooler's nutrition and PA with licensed Latino FCCH providers and Latino parents (four of each type).

Results:

Focus group data revealed that Latino parents have strong opinions about what their children should or should not eat; also that they are more concerned about quantity than nutrition recommendations. Providers are influenced by dietary and PA guidelines, which they incorporate into daily routine for children in care.

Conclusions:

Latino FCCH providers are more grounded in training on nutrition and PA than Latino parents due to state regulations and licensing requirements; thus face challenges of conflicting priorities. Both Latino FCCH providers and parents would benefit from new hands-on educational resource and training strategies that assess and address providers' and parents' efficacy and misconceptions plus inform about evidence-based practices related to child feeding, nutrition and PA

P103

Early entrance to childcare and changing childcare places associated with children's overweight in Finland

Authors:

Reetta Lehto, Päivi Mäki, Carola Ray, Tiina Laatikainen, Eva Roos

Purpose:

Different forms of non-parental childcare have been found associated with overweight in children in some, but not all studies. Studies on the matter are mainly American. Objective of this study was to examine different aspects of childcare use and overweight in Finland.

Methods:

The cross-sectional data consists of 1684 3- and 5-year-old children participating in the Child Health Monitoring Development project study (LATE-project), conducted in 2007-2009 in Finland. Children's weight and height was measured at health check-ups by trained nurses and parents completed a questionnaire including questions on childcare use. Overweight (including obesity) was defined according to international BMI limits.

Results:

Entering childcare under one year of age and having had many childcare places were associated with increased risk of overweight among 5-year-old Finnish children. Neither current form of childcare nor current hours at childcare were associated with overweight. The results were adjusted for birth weight, family background variables and child's PA, TV viewing and eating behavior.

Conclusions:

Entering childcare very early and having had many childcare places were associated with overweight even when adjusting for family SES and child's energy balance-related behaviors. Reasons for these associations can only be speculated. Stress may play a role.

P104

Dietary salt intake and childhood obesity in 8-10yr old Irish school children

Authors:

Janas M Harrington, Eimear Keane, Amy O'Flynn, Gemma Browne, Ivan J Perry

Purpose:

High salt diets are associated with increased obesity and cardiovascular risk. Currently 1 in 4 Irish children are either overweight or obese. As in other developed and developing countries childhood obesity and subsequent diabetes are major public health problems. This study aimed to assess the association between dietary salt intake and obesity in Irish school children.

Methods:

Cross sectional data from 1075 8-11 year old primary school children in Cork. Dietary salt was objectively early morning urine samples (n=816). Estimates of 24 hour salt intake used spot samples adjusted for mean 24 hour urinary volume/kg body weight. Urinary sodium measurements are presented in grams of salt per day.

Results:

Mean salt excretion was 5.0 g/day (95% CI 4.8-5.2; sd =2.5g/day; median =4.6g/d). Salt excretion did not differ by sex. Almost half of children (43%) had salt intakes above the recommended limit of 5g/d. In linear regression models salt intake was significantly associated with child BMI (B 0.37; 95% CI 0.32-0.42). Adjusting for parental BMI, soft drink and parental reported child physical activity intake did not attenuate the association in the final model (B 0.32; 95% CI 0.24-0.41).

Conclusions:

High salt diets in children, if left unaddressed will place significant burden on our future health systems. A population approach to salt reduction has the potential to help curb the current childhood obesity epidemic and thus improve the cardiovascular health of future generations.

P105

Dietary salt intake assessed by spot and 24 hr urinary sodium excretion in 8-10yr old Irish school children

Authors:

Janas M Harrington, Eimear Keane, Ivan J Perry, Gemma Browne

Purpose:

Few studies have objectively measured dietary salt intake in children, and no Irish data exists. This study aims to measure total dietary salt intake in Irish children assessed by urinary sodium excretion from spot and 24 hour samples.

Methods:

Cross sectional data from 1075 8-11 year old primary school children in Cork. Dietary salt was objectively assessed using 24 hour urine collections (n=87) and early morning urine samples (n=816). Of the 87 participants with 24 hour samples, 10 were excluded from analysis for providing incomplete samples. Self-reported discretionary salt use was derived from a general health and lifestyle questionnaire. Estimates of 24 hour salt intake used spot samples adjusted for mean 24 hour urinary volume/kg body weight. Urinary sodium measurements are presented in grams of salt per day.

Results:

Mean urinary salt excretion was 5.3g/day (sd=2.5g/day; median=4.9g/day) based on 24 hour collections. Mean salt excretion based on spot urine samples was 4.9 g/day (sd =2.5g/day; median =4.5g/d). Salt excretion did not differ by sex. Almost half of children (43%) had salt intakes above the recommended limit of 5g/d. Children who added salt

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every/most days had significantly higher salt excretion ($P<0.05$) compared to those who never added salt to food at the table.

Conclusions:

Almost half of children exceeded the upper recommended age-specific limit for salt intake, with no evidence of a gender differential. This study shows that salt estimates from spot urine samples are an alternative method for surveillance of salt intake at a population level in children.

P106

Measuring real-time snack consumption among youth from low socio-economic status families: A mobile-based Ecological Momentary Assessment (mEMA) study

Authors:

Jorinde Spook, Theo Paulussen, Gerjo Kok, Pepijn Van Empelen

Purpose:

In the present mobile-based Ecological Momentary Assessment (mEMA) study we examined contextual factors as predictors of low socio-economic status (SES) youth' snack consumption (SC) from a dual process model perspective. Craving and intention were therefore added to our theoretical model.

Methods:

During seven consecutive days, 80 participants (68% female) received prompts from the mEMA-app four times a day, containing questions regarding contextual factors that influenced their SC during the previous 3.5hours (i.e., location, physical activity and social context). Rational and impulsive behavioral processes were assessed via snacking intention and craving. Multilevel analysis (i.e., time of day nested within individuals) was conducted in SPSS.

Results:

Univariate analyses showed significant relations between the contextual factors and SC, craving and SC; intention had no association with SC. Multilevel regression analysis indicated that SC increased during the day ($OR=5.0$, $p=.000$), but was less likely when being at home ($OR=0.4$, $p=.000$), at school ($OR=0.4$, $p\leq .01$), when students had been physically active ($OR=0.4$, $p\leq .01$), and when they were in the presence of other people ($OR=0.5$, $p\leq .01$). Inclusion of craving showed that SC increased highly as a result of craving ($OR=17.7$, $p=.000$). The experience of craving was lower in the context of being at school ($OR=0.4$, $p\leq .05$) or in the presence of others ($OR=0.6$, $p=.06$).

Conclusions:

From a dual process perspective we concluded that low SES youth' snack consumption occurs rather impulsively than controlled by cognitions, which may be triggered by contextual factors.

P107

Do attitudes and beliefs about nutrition determine diet quality?

Authors:

Yen Li Chu, Kate Storey, Paul Veugelers

Purpose:

Increased understanding of attitudes and beliefs about nutrition among children can inform efforts to effectively target health promotion. The purpose of this study is to determine child attitudes and beliefs about nutrition, and to examine their associations with diet quality.

Methods:

A provincially representative sample of grade 5 students ($n=2,240$) from 143 schools in Alberta, Canada was surveyed. Children were asked how much they cared about eating healthy foods (attitude). Children were also asked if they thought the foods they eat influences their health, body weight, and school performance (belief). Diet quality was measured using the Diet Quality Index (DQI-I) calculated based on responses to the Harvard Youth/Adolescent Food Frequency Questionnaire. Random effects models with children nested within schools were used to test for associations.

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Results:

Most (81%) of the surveyed children indicated that they cared a lot about eating healthy foods. Children who cared very much had higher DQJ-I scores ($B = 8.3$, 95% CI: 5.5, 11.1) compared to children who did not care. Approximately half of all surveyed children agreed that dietary intake influences health, body weight, and school performance. However, agreement with these statements was not associated with diet quality.

Conclusions:

Results of this population-based study indicate that most children had healthy attitudes and beliefs about nutrition. Attitudes are potential determinants of diet quality and could be a health promotion target. The absence of an association between beliefs and diet quality suggests that health education may not be sufficient on its own as a health promotion strategy.

P108

Energy balance and health: A qualitative exploration of 5th graders' perceptions and knowledge

Authors:

Thrudur Gunnarsdottir, Michelle Cardel, Candace Brown, Jimikaye Beck, Megan Mistler-Jackson, Richard Boles, John Peters, James Hill

Purpose:

To explore student perceptions and knowledge about energy-balance-related concepts and how these concepts relate to health.

Methods:

Using a grounded-theory approach, four student focus-groups ($N=25$) were conducted as part of formative research for an obesity-prevention program in Colorado, 5th Gear Kids. Convenience sampling included students from higher-income and lower-income schools, as measured by percentage of students eligible for free-and-reduced-lunch (average FRL%). Two groups ($n=12$, $FRL=74.8\%$) included participants from diverse racial/ethnic backgrounds. The other two groups ($n=13$, $FRL=22.5\%$) included predominantly white participants ($n=10$).

Results:

Both groups identified healthy food and PA as strategies to stay healthy. Healthy and unhealthy foods at the ends of the spectrum were easily identified (e.g. vegetables vs. chips) but everything in between presented challenges for 5th graders to conceptualize. The concept of calories was difficult to comprehend. Calories were perceived as bad for you, associated with becoming overweight, and something people should strive to get rid of. All healthy foods were assumed to have low calorie content and all low-calorie foods were assumed to be healthy. Students discussed activity as creating permission to eat high-calorie junk-food, and watch TV and be sedentary.

Conclusions:

5th graders understand the value of PA and healthy food and the basic concepts of energy-in and energy-out. However, anything outside the extremes of healthy and unhealthy and relating to calories and caloric/energy-balance presents challenges. Educating kids about the science of energy-balance may be beneficial to promote healthy behaviors and prevent childhood obesity and should be explored in future studies.

P109

Effortful control and Energy-Balance Related Behaviors in fifth graders participating in food health & choices obesity prevention intervention

Authors:

Marissa Burgermaster, Heewon Lee, Isobel Contento, Pamela Koch, Matthew Graziose

Purpose:

Effortful control (EC) is the self-regulatory aspect of temperament that serves to control impulses and promote goal-oriented behavior. It seems to be protective against risky behaviors. This study aimed to determine relationships between effortful control and energy-balance related behaviors (EBRBs) among urban early adolescents.

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Methods:

An 81-item questionnaire, including the EBRB items from the previously validated FHC-Q and the EC scale from Rothbart's Early Adolescent Temperament Questionnaire - Revised, was administered in a sample of 5th graders (n=281) before participating in Food Health & Choices. Internal consistency was assessed using intraclass correlations and factor analyses. Relationships between EBRBs and EC were examined using two-tailed Pearson correlations.

Results:

Two items were removed from the EC scale, resulting in an acceptable Cronbach's alpha (0.69). Significant correlations were observed between EC and screen time frequency ($r=-.213$, $p<.01$) and duration ($r=-.210$, $p<.01$), fruit consumption ($r=.128$, $p<.05$), and fast food sizes ($r=-.15$, $p<.05$). For boys, EC was related to screen time frequency ($r=-.265$, $p<.01$) and duration ($r=-.309$, $p<.01$), drink ($r=-.194$, $p<.05$) and snack ($r=-.221$, $p<.05$) consumption, and snack ($r=-.215$, $p<.05$) and fast food ($r=-.217$, $p<.05$) sizes. For girls, EC was related to fruit consumption ($r=.251$, $p<.01$), vegetable consumption ($r=.186$, $p<.05$), and activity duration ($r=.221$, $p<.05$).

Conclusions:

Results suggest EC is related to EBRB and different by gender. Girls with greater EC tended to engage in more positive EBRBs; boys with greater EC tended to engage in fewer negative EBRBs. This suggests that gender differentiation may be warranted for EBRB interventions to change behavioral mediators.

P110

A case study of the implementation of a healthy kids menu in an urban, Mexican restaurant in the midwest United States

Authors:

Daniel Schober, Courtney Pinard, Michelle Woodruff, Leah Carpenter, Amy Trivedi, Amy Yaroch

Purpose:

Increasingly, more meals are consumed away from home. The purpose of this study is to describe the development of a healthy kids menu in a Mexican restaurant in Omaha, Nebraska, share the process of implementing the menu, and share final results (forthcoming).

Methods:

We used a mixed methods design. Participants were patrons of a Mexican restaurant in Omaha, Nebraska (USA), aged 5-12 years (and their parents). The development, implementation, and evaluation of the new menu involved 6 steps: 1.) Gathering baseline data on ordering behavior, 2.) Developing healthier alternatives, 3.) Taste testing alternatives with parent-child dyads (N=34), 4.) Pilot testing alternatives during lunch/dinner hours, 5.) Launching the new healthy kids menu, and 6.) Evaluating effects on ordering behavior. We used a MICROS cash register to track child orders and ages (steps 1, 4, 6), a semi-structured, qualitative interview to evaluate new menu items, and a survey to measure acceptance of new menu items (step 3). Thematic analysis and descriptive statistics were used to analyze implementation and evaluation data.

Results:

Six new menu entrees were implemented and ordered by a variety of children aged 5-12 years. All entrees were lower in calories, fat, and saturated fat compared to the most popular items ordered at baseline.

Conclusions:

Moving forward with environmental nutrition strategies for obesity prevention, it will be important to continue to develop and test innovative approaches to promote menu items for children that are healthy and appealing to children and adults.

P111

Determinants of fruit and vegetable preferences and intake in Latino children

Authors:

Lauren Cook, Nicole Gatto, Chih-Ping Chou, Gillian O'Reilly, Donna Spruijt-Metz, Jaimie Davis

Purpose:

Preferences are consistently associated with fruit and vegetable (F&V) intake, yet the relationship between F&V intake and other determinants is not fully understood. The objective of this study is to examine the effect of F&V willingness to try, correct identification, and preferences on intake in Latino children.

Methods:

This cross-sectional study of 289 3rd-5th grade students (9.3 ± 0.9 years, 47% male, 76% Latino), included the following questionnaire measures: F&V intake via Block Kids Food Screener (last week version), F&V identification and preferences (17 vegetables, 8 fruit), and F&V willingness to try (5 items each for F&V). The sample was divided into two groups with variables relevant to fruit in one group, and vegetables in the other. Structural equation modeling with a multiple-group approach examined differences between these two groups on: 1) effect of willingness and identification on preferences, 2) effect of preferences, willingness and identification on intake.

Results:

The final partially constrained model had good fit ($\chi^2=40.7$, $df=38$, $p=0.35$). Significant differences were found: in both F&V, willingness predicted preferences ($\beta_{veg}=0.49$, $\beta_{fruit}=0.43$) and intake ($\beta_{veg}=0.22$, $\beta_{fruit}=0.17$); in fruit, identification predicted preferences ($\beta_{fruit}=0.14$, $p<0.05$); in vegetables, willingness was a stronger predictor of preferences than in fruit ($p<0.05$). Significant associations remained after adjusting for age and sex.

Conclusions:

Contrary to the vast majority of literature, preferences did not predict F&V intake, yet the more distal determinant, willingness to try, did. Exposure-based practices (including gardening and tasting novel F&V) have been shown to increase willingness and are thus relevant for interventions.

P112

Child menus in independent restaurants in Imperial County, California, USA: Availability and use

Authors:

Lucy Horton, Sheila Gahagan, Michelle Zive, Hala Madanat, Guadalupe Ayala

Purpose:

Calories consumed away-from-home by children are increasing with current estimates indicating that 50% of calories come from outside the home, where foods are typically higher in fat and sugar. Given current increases in child menus in national chain restaurants, the present study examines availability and use of child menus in independent restaurants frequented by Mexican-American families to inform future interventions reducing childhood calorie intake in restaurants.

Methods:

Trained staff audited a random sample of 69 (37%) restaurants in Imperial County, California, using a modified version of the Nutrition Environment Measures Survey-Restaurants. Additionally, trained bilingual staff interviewed 219 Mexican-American resident mothers enrolled in a family-based nutrition intervention. The mothers' mean age was 39 and 80% were Mexican-born. Data were analyzed using SPSS v20.

Results:

Audits identified 44% independent restaurants, of which 17% offered child menus. Interviews identified 48 (23%) families, including 107 children (mean age 9.64) who ate out once a week or more. Of these children, 71% ate from adult menus. Importantly, 67% mothers reported that the child decides what to eat, rather than the adult, or the child and adult together.

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Conclusions:

This study in Imperial County indicates some families eat out frequently and child menus are rarely available in most independent restaurants. Additionally, children independently decide what to eat and mainly order from adult menus. Given that Mexican-American children are at higher risk of obesity compared with children of other races/ethnicities, future restaurant interventions should consider methods for modifying food ordering and consumption behaviors of children toward healthier options.

P113

Application of the understanding by design model in the adaptation of the Cooking with Kids curriculum to encourage classroom teacher use and acceptance

Authors:

Leslie Cunningham-Sabo, Meena Balgopal, Lynn Walters, Barbara Lohse

Purpose:

Cooking with Kids (CWK), an experiential nutrition education curriculum was originally developed as a classroom enrichment series taught by informal educators. This study describes its evaluation for academic relevance by elementary school teachers and subsequent modification for use within a childhood obesity prevention intervention.

Methods:

Evaluation and modification occurred through this process: 1) Scoring rubrics using state academic standards for five content areas were developed by a curriculum specialist and applied to 10 CWK lessons. 2) District science and health educators individually evaluated these lessons and participated in a focus group interview about its relevance to district needs (student, teacher, and school). 3) Lessons were then revised in accordance with evaluation findings by our team of curriculum developers, researchers and nutrition education experts. 4) Teachers and food educators co-taught the revised lessons in formal classroom settings and reflected on the experience.

Results:

Curricular revisions included: a) A lesson plan format consistent with Understanding by Design and inquiry-based instruction; b) greater in-depth instruction on referenced content standards, especially health and mathematics; c) locally-relevant content; d) opportunities for differentiated instruction; and e) standards-based assessments. Lesson debriefings from over 200 lessons conducted by 4 food educators and 23 teachers revealed overwhelmingly positive experiences with the revised curriculum, in part because of locally-relevant connections, hands-on experiences, and integration of reading, writing, mathematics, and assessment activities.

Conclusions:

Considering academic standards and instructional pressures on teachers, local needs facilitated translation of a tested nutrition education curriculum to one that supports greater dissemination and implementation vigor.

P114

Associations among behavioral, social, and environmental variables and healthy and unhealthy dietary behaviors among ethnically-diverse 4th grade children

Authors:

Alexandra Evans, Chanam Lee, Young-Jae Kim, Diane Dowdy, Marcia Ory, Deanna Hoelscher

Purpose:

Compared to the relatively large number of studies examining the relations among built environment and dietary behavior variables among adults, very few studies have investigated these relations among children. The purpose of this study was to examine the associations among behavioral, social, and environmental (both proximal and distal) variables and healthy and unhealthy dietary behaviors among a sample of ethnically-diverse 4th grade children living in Texas.

Methods:

Fourth grade children and their parents completed self-report surveys. The Child Survey included items assessing dietary intake of healthy and unhealthy foods, and the 'home food' environment (including availability of certain foods

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at home, family rules regarding specific eating behaviors), and physical activity/sedentary behaviors. Geographic Information System (GIS) was used to objectively assess 'neighborhood food' environments, including availability of various food outlets, safety conditions, and street connectivity within a 1km buffer area around each child's home.

Results:

Participants included 1774 4th grade students (51% females; 63% Hispanic; 72 percent low socio-economic status) and parents. Home food availability of healthy foods, more family rules about eating while watching TV, less sedentary behaviors, and more time spent outdoors and in sports teams/lessons were positively associated with a higher healthy eating score. None of the neighborhood-level food environment and other built environment variables were related to children's eating behaviors.

Conclusions:

This study offers insights into the multi-level factors contributing to explaining children's dietary behaviors. Developing strategies to help increase the availability of health food options at home appears important to promote healthy diet among children.

P513

Insufficient sleep among elementary and middle school students is linked with elevated soda consumption and other unhealthy dietary behaviors

Authors:

Rebecca Franckle, Jennifer Falbe, Steven Gortmaker, Catherine Giles, Lauren Smith, Elsie Taveras, Thomas Land, Kirsten Davison

Purpose:

Sleep and diet quality are both associated with elevated obesity risk in youth. Few studies have assessed associations between these risk factors. This study examines the extent to which insufficient sleep is associated with adverse diet in students taking part in Mass in Motion Kids.

Methods:

Data were drawn at baseline (Fall 2012) for all 4th and 7th grade children enrolled in public schools in two Massachusetts communities. At the time of mandated BMI screening, students completed a survey that assessed diet, physical activity, screen time, and sleep. Of the 2781 students in grades 4 and 7, 2271 (82%) had complete survey data. GEE linear regression models were used to adjust for grade, race, gender and clustering of observations within schools.

Results:

On a usual day, 61.5% of students reported insufficient sleep (<10 hours/day). In unadjusted models, more sleep was associated with more frequent fruit and vegetable consumption and less frequent soda consumption (p-values <0.05). After controlling for covariates, students who reported sleeping >10 hours/day consumed soda less frequently ($\beta = -0.13$, 95% CI -0.21, -0.06) and vegetables more frequently ($\beta = 0.08$, 95% CI 0.01, 0.15) compared with students who reported insufficient sleep. No significant adjusted associations were observed between sleep duration and fruit, 100% juice, juice drinks or water.

Conclusions:

Among students in two Massachusetts towns, insufficient sleep duration was associated with more frequent soda consumption and less frequent vegetable consumption. Longitudinal research is needed to confirm these relationships and to inform subsequent interventions.

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P115

Feasibility of a worksite wellness program utilizing lifestyle and behavior change methods for weight management

Authors:

Sarah Hibbs-Shipp, Melissa Wdowik, Garry Auld, Laura Bellows

Purpose:

This study was performed to test the feasibility of a pilot worksite wellness program for weight management. The Healthy You program utilized a lifestyle and behavior change curriculum focused on mindful eating and physical activity.

Methods:

The intervention, developed using Social Cognitive Theory, consisted of 2 one-on-one interviews with a registered dietitian and 10 weekly on-site group nutrition/physical activity lessons. Assessments included pre/post anthropometrics, 3-day food diaries, 24-hr dietary recalls, and surveys (dietary knowledge, self-efficacy and physical activity and cooking behaviors). A 2-month post-intervention phone interview ascertained participant's continued lifestyle and behavior changes and recommendations for program changes. Analyses included paired samples t-tests and content review of interviews.

Results:

On average, the participants (n=18) lost 5.81 pounds, reduced BMI by 1.10 units, decreased waist circumference by 4.27 cm and reduced body fat by 3.65 percent, (all $p < .001$). Participants reported decreased percentage of total calories from fat (6.5 %, $p = .001$), decreased grams of daily sugar intake (20.80 g, $p = .016$), and increased total daily servings of fruits and vegetables (1.4, $p = .049$). Surveys indicated increased self-efficacy/attitude ($p < .001$), increased portion size knowledge ($p < .001$), and increased number of weekly evening meals prepared at home (1.04, $p < .001$). Phone interviews (n=10) indicated continued positive behavior change/self-efficacy, and that the program was beneficial and the environment supportive.

Conclusions:

Results from the Healthy You program demonstrate significant positive anthropometric and lifestyle behavior changes in adults, suggesting its potential as a worksite wellness program.

P116

A lesson in business: Cost-effectiveness analysis of a novel financial incentive intervention for increasing physical activity in the workplace

Authors:

Mary Dallat, Ruth F. Hunter, Mark A. Tully, Karen J. Cairns, Frank Kee

Purpose:

To perform a cost-effectiveness analysis (CEA) of a quasi-experimental trial, exploring the use of financial incentives to increase employee physical activity (PA) levels, from a healthcare and employer's perspective.

Methods:

Employees used a 'loyalty card' to objectively monitor their PA at work over 12 weeks. The Incentive Group (n=199) collected points and received rewards for minutes of PA. The No Incentive Group (n=207) self-monitored their PA only. Quality of life (QOL) and absenteeism were assessed at baseline and 6 months follow-up. QOL scores were converted into productivity estimates using a validated algorithm. The additional costs of the Incentive Group were divided by the additional quality adjusted life years (QALYs) or productivity gained to calculate incremental cost effectiveness ratios (ICERs). Cost-effectiveness acceptability curves (CEACs) were used to characterize and value the uncertainty in our estimates.

Results:

The Incentive Group performed more PA over 12 weeks and by 6 months had achieved greater gains in QOL and productivity ($p < 0.05$). The ICERs were £2,900/QALY and £2,700 per percentage increase in overall employee productivity. Whilst the confidence intervals surrounding these ICERs were wide, CEACs showed a high chance of the intervention being cost-effective at low willingness-to-pay (WTP) thresholds.

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Conclusions:

This intervention is potentially cost-effective from both a healthcare and employer's perspective but further research is warranted to reduce uncertainty in our results. It is based on a sustainable "business model" which should become more cost-effective as it is delivered to more participants and can be adapted to suit other health behaviors and settings.

P117

The role of family, friend, and coworker support in weight gain prevention among a school employee sample

Authors:

Monica Wang, Lori Pbert, Stephenie Lemon

Purpose:

To examine the longitudinal associations between various sources of support (family, friends, and coworkers) to eat healthy and be physically active and weight among school employees participating in a weight gain prevention intervention.

Methods:

Data are from 782 adults employed across 12 public high schools participating in a cluster-randomized multilevel weight gain prevention intervention. Primary predictors of interest included summary scores of support for two types of behaviors (eating healthy and being physically active) from three support sources (family, friends, and coworkers) obtained via self-administered surveys. The primary outcome (weight in pounds) was measured by trained staff. Data were collected at baseline and two follow-up time points (12 and 24 months). Linear mixed effects models examined the association of all three support sources with weight, adjusting for intervention status, time, gender, age, and clustering of individuals within schools.

Results:

Multivariable models indicated that friend support for healthy eating predicted weight loss at 24 months ($B=-0.2$; $p=0.03$), whereas family and coworker support did not. With respect to physical activity, family ($B=-0.8$; $p=0.02$) and friend support ($B=-0.09$; $p=0.03$) were associated with weight loss, but coworker support was not. When support for both behaviors from all three sources were included, only friend support for physical activity ($B=-0.8$; $p=0.04$) was associated with weight loss.

Conclusions:

Findings suggest that among adult employees, friends may comprise a key source of influence in providing support for weight management behaviors, particularly physical activity, associated with weight loss.

P118

Patterns, correlates and moderating effects of occupational sitting in Australian employees

Authors:

Katrien De Cocker, Mitch J Duncan, Camille Short, Jannique GZ van Uffelen, Corneel Vandelanotte

Purpose:

The aims of the present study were to (1) examine patterns of occupational sitting, (2) identify socio-demographic, health-related, work-related and psychosocial correlates of this health-related behavior, and (3) examine the moderating effect of work-related factors in the relation between correlates and occupational sitting.

Methods:

Randomly selected Australian adults completed a web-based survey assessing socio-demographic (country of birth, gender, age, education, income), health-related (general health, weight status, physical activity level), work-related (employment status, occupational task, occupational classification) and sedentary-specific psychosocial (social norm, social support, self-efficacy, control, advantages, disadvantage, intention) factors, and sitting time in multiple domains. T-tests, ANOVA's and multiple linear regression analyses were conducted on a sample of employed adults ($n=993$; mean age 51.0 [11.2] years; 46.5% men).

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Results:

Respondents sat on average for 3.75 (SD=2.45) hours/day during work. The investigated correlates explained 41% of the variance in occupational sitting. More occupational sitting was associated with being male, a younger age, higher education and income, part- and full time employment, sedentary job tasks, higher occupational classification, higher BMI, and perceiving more advantages of sitting less at work. Employment status and occupational classification moderated the association between control to sit less and occupational sitting. No other moderating effects were found.

Conclusions:

The most important contributors of occupational sitting were the work-related and socio-demographic correlates of sitting at work. Future studies need to further investigate the role of psychosocial correlates of occupational sitting in order to develop effective interventions aimed to reduce sitting at work.

P119

Worker perceptions of the social and organizational environments in the workplace and nutrition and physical activity behaviors

Authors:

Rachel G. Tabak, J. Aaron Hipp, Christine Marx, Ross C. Brownson

Purpose:

Organizational climate and culture of a workplace may be related to worker nutrition, physical activity, and energetics behaviors, but this has not been investigated in a large, diverse population of workers.

Methods:

Phone interviews were conducted with a cross section of 1696 working adults in four metro areas in Missouri, USA. Logistic regression models explored the relationship between social/organizational factors (e.g., seeing co-workers engaging in healthy behaviors and feeling the company values their health) and diet (ate at least 1 fruit or vegetable per day) and physical activity (150+ minutes per week) behaviors and obesity (BMI<30). Models were adjusted for race, employer size, age, sex, and income.

Results:

Workers who agreed that their company valued their health were less likely to be obese (aOR=0.73, 95% CI=0.5-0.98), and more likely to get adequate physical activity (aOR=1.5, 95% CI=1.1-2.2)). Those who reported seeing co-workers eating fruits (aOR=1.3, 95% CI=(0.999-1.7) and vegetables (aOR=1.4, 95%CI=1.1-1.9) were more likely to do so themselves, though the association with eating at least one fruit per day was no longer significant after adjustment. Similarly, employees reporting seeing co-workers exercising were more likely to be physically active for at least 150 minutes per week (aOR=1.56, 95% CI=1.2-2.0).

Conclusions:

The social and organizational environments in the workplace, an environment in which employed adults spend large portions of their time may be related to obesity nutrition and physical activity behavior. Future studies should investigate interventions to modify this aspect of the environment to determine if this can improve behavior and health.

P120

Farm to Worksite: Assessing the implementation of a technology-based program in the midwest United States

Authors:

Leah Carpenter, Hollyanne Fricke, Teresa Smith, Daniel Schober, Courtney Pinard, Farryl Bertmann, Amy Yarocho

Purpose:

The purpose of this study was to increase access to local fruits and vegetables (FVs) by implementing a technology-based Farm to Worksite (F2W) program, which was designed to maximize efficiency and ease for the producer and consumers through use of internet ordering and worksite pick-up.

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Methods:

This embedded design mixed-methods study utilized a quantitative survey to assess employee attitudes and behaviors associated with purchasing local foods at pre- and post-implementation. During program implementation, additional data were collected through participation and sales tracking, and qualitative data were collected through employee intercept interviews. Additionally, in-depth stakeholder interviews were conducted at post-implementation. Descriptive statistics and Fisher's Exact test were used to assess change from pre- to post-implementation.

Results:

Of the 21 employees who participated in both the pre- and post-implementation surveys, 95.2% reported that they would participate in a Farm to Worksite program next season. The percentage of employees whose household primary shopper purchased FVs from farmer's markets and farm stands increased significantly ($p < 0.05$). There was a positive increase in purchasing FVs through the F2W program and perceived access to healthy foods at work (7.7% to 70.6% and 48.2% to 60.0%, respectively). Additionally, sales and participation increased weekly, due to increased awareness and acceptance. Interview data supported these findings.

Conclusions:

Implementing the technology-based strategy of online ordering and worksite pick-up contributed to the positive outcomes of this program. Evidence from this study support F2W programs as effective ways to increase access to local FVs for employees.

P121

Formative research to tailor a worksite intervention to promote health in public utility workers

Authors:

Rachel G. Tabak, Ross C. Brownson, Joan Heins, Bradley Evanoff, William Peck

Purpose:

This study seeks to understand the needs, attitudes and values among employees, who are at high risk, working in energy production plants to select optimal interventions to promote healthy eating and activity.

Methods:

Qualitative methods included 5 individual interviews and 1 focus group with managers/supervisors ($n=3$), 2 interviews with human resources/wellness staff, 3 interviews with plant-based nurses, 6 focus groups with employees including laborers, machinists, repairmen, technicians, operations, and 3 lunch observations. These data were recorded and transcribed then coded inductively and deductively, using iterative methods. Themes regarding benefits, barriers, and attitudes toward participation in workplace healthy eating and activity programs/interventions; perceptions of environment and policy supports; and environmental changes identified that may enhance healthy eating and activity were explored. Pilot testing of a previously validated worksite environment questionnaire among this unique population was conducted with 3 employees at each of 3 plants.

Results:

Coding is ongoing. Initial results suggest perceptions of supervisor non-support for exercise during lunch breaks is a barrier; environmental barriers to healthy eating include unhealthy foods in break-rooms and vending options. Additional findings describe: How changes to the organizational culture related to safety can inform changes in nutrition and activity; foods eaten at lunch; and quantitative survey results. Complete analyses will be presented.

Conclusions:

Worksites represent an important venue for health promotion, particularly for individuals working in factory settings. Discussions with employees/management can provide important insights regarding current conditions and mechanisms for successfully bringing about changes. Findings presented will inform intervention development in this population.

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Reliability and validity of a theory of planned behavior instrument for behavior change leading to weight loss

Authors:

Alicia Landry, Jennifer Lemacks, Catherine Walker O'Neal

Purpose:

The purpose of this study is to evaluate the reliability and validity of measures of Theory of Planned Behavior (TPB) constructs as they relate to Stages of Change (SOC) and reported fruit and vegetable intake (FVI) and physical activity (PA) for weight loss in obese and overweight individuals. Key to TPB is that attitude, subjective norm, and perceived behavioral control determine intention and intention becomes a progression to behavior. Intention may be a summary measure of motivation and an important precursor to stage changes which result in behavior modification.

Methods:

Data were collected from 5 health clinics in the south and only overweight and obese participants (n=114 of 161) were included. Confirmatory factor analysis and Chronbach's alpha were used to establish reliability of TPB measures for weight loss; path analysis was used to evaluate relationships between TPB constructs', SOC, and FVI and PA.

Results:

Chronbach's alphas for TPB constructs indicated good reliability (attitude=.813, subjective norms=.791, perceived behavioral control=.878, intentions for diet=.825, and intentions for PA=.918). Adequate factor loadings were found for all constructs with loadings ranging from .42 to .97. Paths from TPB constructs to Intention were significant ($p<.005$). Paths from Intention to SOC and PA behavior were significant ($p<.005$) but not from Intention to FVI ($p=.17$).

Conclusions:

This study provides preliminary evidence for utilization of a reliable and valid instrument assessing TPB constructs for weight loss using dietary and PA behaviors in overweight and obese individuals. Future research will investigate the relationship between intention, SOC, and FVI.

P123

Perceived health, eating behaviors and fitness among active and inactive overweight and obese rural women: Findings from the Women Weigh-in for Wellness study

Authors:

Patricia Hageman, Linda Boeckner, Paul Dizona, Carol Pullen

Purpose:

This study compared perceived health, eating behaviors and fitness between active and inactive overweight and obese rural women, a population considered vulnerable for disability.

Methods:

Cross-sectional baseline data were examined from 301 rural women, ages 40-69 (BMI =28-45 kg/m²) who enrolled in a web-based clinical trial for weight loss and weight maintenance (ClinicalTrials.gov NCT01307644). The Behavior Risk Factor Surveillance System survey was used to assess activity, using a cut-score of ≥ 500 MET·min·wk⁻¹ to define women as active. Survey data and biomarkers were collected using validated instruments. Independent t-tests were used for analysis.

Results:

Of 301 women, 104 (34.5%) were classified as active. No differences were observed between active and non-active women in age, waist circumference, and kcal intake. Active women had lower BMI ($p=0.015$), higher dietary quality via Healthy Eating Index-2005 ($p=0.03$), and higher fitness completing faster 400-m walk-times with less perceived exertion than inactive women ($p=0.001$). Comparison of PROMIS-29 self-reported health domains revealed active women perceived less fatigue ($p=0.002$), higher physical function ($p=0.013$) and higher social satisfaction with roles ($p<0.004$) than inactive women; and no differences were observed between groups in health domains of anxiety, depression, pain and sleep.

Conclusions:

Active overweight and obese rural women differed from their inactive counterparts with healthier dietary quality and fitness, and better perceived health in domains of fatigue, physical function, and social satisfaction with roles. This research supports the benefits of activity, even among overweight or obese women.

P124

Postmenopausal women with abdominal obesity making decisions about a nutritional approach for weight loss: A needs assessment

Authors:

Nadine Poirier, France Légaré, Dawn Stacey, Simone Lemieux, Catherine Bégin, Annie Lapointe, Sophie Desroches

Purpose:

To identify decisional needs of postmenopausal women with abdominal obesity when choosing between two nutritional approaches for weight loss: A low fat diet or a diet rich in fruits and vegetables.

Methods:

Qualitative study with 17 postmenopausal women aged 40 to 65 years (median 59 years) and with a waist circumference ≥ 88 cm. Women participated in one of four focus groups led by a moderator using a semi-structured interview guide based on the Ottawa Decision Support Framework. Thematic content analysis of verbatim transcripts was performed using NVivo10.

Results:

For the low fat diet, women mentioned health benefits and greater weight loss as advantages of following that diet without specifying any major disadvantage. Facilitators for the decision to choose a low fat diet were having access to pre-prepared low-fat dishes and restricting high-fat foods purchases, while low palatability of low-fat foods and eating out were perceived as barriers. For the diet rich in fruits and vegetables, women perceived the satiating effect of that diet as being an advantage and intestinal disturbances as a disadvantage. Facilitators for the decision to choose a diet rich in fruits and vegetables were visual attractiveness and getting new recipes, whereas costs and time needed for preparation were considered as barriers.

Conclusions:

Women choosing a nutritional approach weigh advantages and disadvantages as well as feasibility of implementing options. Our results are being used to inform the development of decision support nutritional interventions that will address the needs of women for making and implementing this decision.

P125

What is it about a weight management programme delivered in professional football clubs that attracts men and keeps them engaged?

Author:

Kate Hunt, on behalf of the FFIT team

Purpose:

Between June and September 2011, we attracted 747 men aged 35-65 years with $\text{BMI} \geq 28 \text{ kg/m}^2$ to take part in a randomised controlled trial (RCT) of the Football Fans in Training (FFIT) weight management programme in Scotland. To inform further development of interventions in football club settings, this paper investigates who took part in FFIT, why they chose to take part and what enabled their continued engagement.

Methods:

To investigate who took part in FFIT, we analysed baseline data on participants in the RCT. To understand why they took part and what kept them engaged, we analysed data from 13 focus group discussions with 63 men who had attended the programme.

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Results:

Objectively-measured mean body mass index at baseline was 35.3 kg/m² (SD 4.9). Between 72% and 80% of participants were at very high risk of ill health and less than 4% had attended a commercial or health-sector weight loss programme in the previous 3 months. 'Push' factors to the programme included concern for future health and a desire to 'be there' for families. 'Pull' factors included the powerful attraction of the football club setting. Early experience of the programme, its location and style of delivery and enjoyment of the interactions it engendered, served to support continued engagement.

Conclusions:

FFIT is an example of how to facilitate health promotion activities in a way that is consistent with, rather than challenging to, common ideals of masculinity.

P126

Weight Loss Maintenance in Adults (WILMA) trial: Mediators of weight maintenance outcomes

Authors:

Rachel McNamara, Sharon A Simpson, Christine Shaw, Mark Kelly

Purpose:

Weight loss maintenance interventions have had limited effectiveness with weight regain common. The purpose of this study was to assess a 12-month individually tailored intervention based on Motivational Interviewing (MI) and self-monitoring. This is the first trial of a weight loss maintenance intervention in the UK.

Methods:

WILMA was a 3-arm individually randomised controlled trial comprising 2 intervention arms which differed in amount of therapist contact only, and a control arm (usual care). Individuals were followed up at 6 and 12 months post-randomisation. 170 obese adults aged 18-70 with a current or previous BMI of 30+ who had lost at least 5% body weight during the previous year were recruited. The primary outcome was BMI at 12 months and results are reported elsewhere. Mediators associated with weight change were also assessed and included: Self-efficacy, social support, self-monitoring, habit formation and intrinsic motivation.

Results:

We undertook mediator analyses to see if identified pathways to effect measured at six months were associated with maintenance at one year. Outcomes were predicted using a hierarchical model controlling for baseline randomisation variables. This analysis was used to assess the theoretical model underlying the intervention which suggests the MI counselling process boosts motivation and self-efficacy, enabling participants to set goals and implementation intentions relating to behaviors that ultimately result in maintenance of weight loss.

Conclusions:

These findings contribute to the knowledge base around key intervention components and functions that effect diet and exercise behaviors, thereby facilitating successful weight loss maintenance.

P127

Women Weigh-in for Wellness: Examination of eating and activity across four categories of weight status in rural women

Authors:

Linda Boeckner, Patricia Hageman, Paul Dizona, Carol Pullen

Purpose:

This study compares eating and physical activity behavioral and biomarkers among overweight, obesity I, obesity II, and obesity III groups of rural, midlife to older women.

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Methods:

Baseline data from a web-based clinical study (ClinicalTrials.gov NCT01307644) focused on weight loss and maintenance in 301 rural women were used for initial assessment of eating and physical activity markers according to weight classifications: Overweight (n=32), obesity I (n=143), obesity II (n=85), and obesity III (n=41). Baseline measures were collected using standardized procedures and validated instruments. One-way Analysis of Variance was used to identify differences.

Results:

Differences (all $p < .04$) were detected for mean intakes of food energy, protein, fat and daily servings of meats and protein-rich foods. Mean fruit, vegetable, whole grain and dairy food intakes were below recommended intakes for a healthful diet but did not differ significantly between all weight categories. Mean walk times (400-m walk test) differed ($p = .000$) with progressively slower walk times as the weight classes progressed. Mean blood pressure of overweight women was normotensive, and prehypertensive among all obesity categories. No differences were found in serum lipid levels except high density lipoprotein-cholesterol ($p = .001$), with mean values highest for the overweight women (52.6 mg/dL) and lowest for obese III women (44.2 mg/dL).

Conclusions:

Overweight and obese rural women had food group intakes and some biomeasures that could ultimately impact health status and fitness over time, laying the groundwork for eating and physical activity behavior change intervention for an improved quality of life.

P128

One size does not fit all: An exploratory evaluation of orthodontic practice types and implications for health promotion

Authors:

Katharine Schmitz, Melbourne Hovell, Sandy Liles, Ashley Hyman, Claudia Carrizosa, Jeanne Nichols, Richard Hofstetter

Purpose:

A trial testing a clinical model of obesity prevention recruited three types of orthodontic practices: Private (PP) and corporate practices (CP) in Southern California, and practices in Tijuana, Mexico (MX). This study examined patient demographics, BMI, and health behaviors by practice type.

Methods:

694 patients 8-16 years of age were recruited from 32 practices: 22 PP (n=520), 2 CP (n=32), and 8 MX (n=142). Height/weight was measured at baseline. Youth/parents reported health behaviors. ANOVA with post-hoc analyses were used to detect group differences.

Results:

Rates of overweight for PP, CP and MX were 12%, 19%, and 18%, respectively. Rates of obesity were 8%, 19%, and 14%. Age/gender-adjusted BMI percentiles differed between PP/CP ($p < .01$) and PP/MX ($p < .001$). 25%, 100%, and 96% of families earned $< \$70,000$ per year for PP, CP, and MX offices, respectively ($p < .001$). 32%, 50%, and 53% of children did no moderate-vigorous PA on weekend days ($p < .001$). Screen-time was \geq two hours for 66%, 63%, and 81% on weekdays and for 94%, 84%, and 81% on weekend days ($p < .01$). 85%, 91%, and 91% ate < 5 servings of fruits/vegetables ($p < .05$). 64%, 78%, and 76% drank sugar-sweetened beverages ($p < .01$). 72%, 87%, and 63% ate fast-food at least once during the past week ($p < .05$).

Conclusions:

Patients in all practice types reported less than desirable health behaviors, and would benefit from intervention. Still, there were clear differences in patient characteristics and health behaviors by practice type. CP and MX practice patients, who generally reported poorer habits, stand to benefit the most.

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P129

Using a mix of scientific methods to investigate barriers or success factors within adult obesity interventions

Authors:

Ann Fenger Benwell, Joreintje Mackenbach, Lynn Stockley, Gill Cowburn, Jeroen Lakerveld, Aileen Robertson

Purpose:

A growing body of literature emphasizes the importance of using both quantitative and qualitative scientific methods to investigate the wide range of factors which hinder or promote the success of interventions to reduce the prevalence of adult obesity. The purpose of this research is to demonstrate how investigative methods can be strengthened even more.

Methods:

Via the EU-funded project SPOTLIGHT (Sustainable Prevention of Obesity through Integrated Strategies) multi-level interventions, to reduce the prevalence of adult obesity, have been identified in Denmark, the UK and the Netherlands. Based on both quantitative and qualitative scientific theories investigative methods were developed and tested for their robustness to examine the factors which facilitated or hindered the success of each intervention in the three countries.

Results:

This pilot test revealed some common success factors: Political support; presence of dynamic and motivated staff; and strong shared values. Hindrance factors included: Lack of funds; lack of political support; poor management; competing projects; and difficulties of meeting the needs of the target group.

Conclusions:

The relative benefits of using qualitative and quantitative methods together in a complementary approach, versus using each method separately, will be presented.

P130

Lifestyle intervention with supervised exercise has beneficial effect on eating behavior and long-term weight loss in obese adults

Authors:

Marjukka Nurkkala, Raija Korpelainen, Leila Karhunen, Kaisu Kaikkonen, Anna-Maria Keränen, Marja Vanhala

Purpose:

To investigate the changes in eating behavior and the factors related with the changes among successful dieters (maintained a weight loss of ≥ 5 % of original weight).

Methods:

Obese subjects (21 male, 55 female, mean age 46, SD 10) were randomized into three-year lifestyle intervention (n=59) and control groups (n=17). Eating behavior (cognitive restraint of eating, uncontrolled eating and emotional eating) was evaluated by the TFEQ-18 and confidence in oneself to achieve goals and tolerance to problems by a separate questionnaire. Weight, height, BMI and maximal oxygen consumption (VO2max) were measured. Statistical comparison was done by using linear mixed model and linear regression.

Results:

Weight decreased 6.0 kg (SD 7.0) in the intervention group and increased 0.8 kg (SD 5.3) in the control group ($p > 0.001$) during the intervention. Cognitive restraint (CR) increased more in the intervention group compared to the controls ($p = 0.004$). The increment in VO2max was associated with increased CR ($\beta = 0.32$, $p = 0.008$, 9 % of the variation) and decreased weight ($\beta = -0.36$, $p = 0.002$, 12 % of the variation). Among successful dieters in the intervention group (n=29) the baseline confidence in oneself to achieve goals was associated with successful weight loss ($\beta = -0.40$, $p = 0.034$, 13 % of the variation) and tolerance to problems with increased CR ($\beta = 0.44$, $p = 0.019$, 16 % of the variation).

Conclusions:

Lifestyle intervention was effective in increasing cognitive restraint. For long-term weight maintenance eating behavior should be evaluated and followed before and during intervention together with strengthening of self-confidence. Furthermore regular physical activity should be encouraged.

P131

Does healthcare professionals' performance in a combined lifestyle intervention for overweight and obese individuals affect changes in motivation and behavior?

Authors:

Geert Rutten, Brenda Berendsen, Jessie Meis, Stef Kremers

Purpose:

In order to monitor implementation, this study aimed to assess healthcare professionals' performance in a combined lifestyle intervention (CLI) for individuals with overweight and obesity. We also assessed changes in the level of physical activity and dietary behavior and the relation between lifestyle coaching and changes in quality of motivation for physical activity and healthy diet.

Methods:

Participants were recruited from 29 locations in the Netherlands. They were assigned to a low intensive (lifestyle coaching (LSC) and dietary advice), or medium intensive (additional physical therapy) setting. Questionnaires were sent at baseline, 4 months and 12 months. Questions concerned demographic factors, BMI, motivation for, based on SELF-DETERMINATION THEORY, and level of physical activity and healthy diet. Data analysis consisted of t-tests and multivariate regression analysis.

Results:

Participants were positive about the lifestyle coach and the physical therapist, but less positive about the dietary advice. LSC was related to improved autonomous motivation, mainly for physical activity in the first 4 months, but autonomous motivation did not significantly improve after 4 months. At one year 56% of the participants combined 2 or 3, mostly individually performed physical activities, on average 3 times a week. Self-reported physical activity changed from on average 43 to 60 minutes a day, no favorable changes were observed for dietary behavior.

Conclusions:

Participants in a CLI for overweight and obese individuals show improved autonomous motivation for and favorable changes in physical activity but not for healthy diet. Dietary advice and coaching may require more specific skills and strategies.

P132

Who are the non-responders to exercise counseling in a 4-year randomized controlled trial? The DR's EXTRA study

Authors:

Leena Hakola, Kai Savonen, Pirjo Komulainen, Maija Hassinen, Timo Lakka, Rainer Rauramaa

Purpose:

We studied the predictors of not increasing aerobic exercise despite exercise counseling during 4 years.

Methods:

Participants were a population-based sample of 57-78 year-old men and women from the DR's EXTRA Study (IS-RCTN45977199), a 4-year randomized controlled trial on the health effects of exercise and diet. The present analyses were performed among those 185 participants in the aerobic exercise group and on 169 participants in the control group who had low baseline levels of aerobic exercise. Intervention included 14 counseling sessions during 4 years. Non-responders were defined those who did not increase moderate-to-heavy aerobic exercise or increased it by <60 minutes per week during 2 and 4 years of follow-up.

Results:

Altogether 46 (25%) participants in the intervention group were non-responders. Age, gender, baseline marital status, education, income, employment, body mass index (BMI), cardiorespiratory fitness, perceived health, number of dis-

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eases, depressive symptoms, social network or support, alcohol consumption, smoking, diet or physical activity did not predict being a non-responder. In control group, 73 (43%) of the participants did not increase aerobic exercise during 4 years, and overweight (BMI 25-29.9), obesity (BMI \geq 30) and low levels of light exercise at baseline predicted not increasing aerobic exercise over 4 years. Intervention group did not modify the associations.

Conclusions:

None of the baseline characteristics predicted being a non-responder to aerobic exercise counseling suggesting that exercise intervention was efficient in increasing aerobic exercise among individuals with different demographic, health and lifestyle backgrounds.

Adult Sitting/Sedentary Time

P133

Profiling sedentary behaviors amongst bus drivers: A pilot study

Authors:

Veronica Varela Mato, Louisa Herring, Stacy Clemes, Tom Yates, Stuart Biddle

Purpose:

Sedentary behavior is an independent risk factor for numerous chronic diseases. Bus drivers are required to sit for the majority of their working day and are known to have an elevated risk of chronic disease, however patterns and overall levels of sedentary and active behaviors accumulated in this population have not adequately been elucidated.

Methods:

Data were collected from 10 bus drivers (age 52 ± 10.2 years, BMI 30.3 ± 3.3 kg/m²) from a local company within the East Midlands, England. Participants wore an activPAL3 and ActiGraph wGT3X+ for 7 days, and completed a daily diary documenting their start and finish work times, and sleep time. The proportion of time spent sedentary according to the activPAL3 and ActiGraph (defined as <100 counts/minute) during waking hours on workdays and non-workdays was calculated, along with the proportion of time spent sedentary during working hours and non-working hours on workdays.

Results:

According to the activPAL, bus drivers spent 75% (781mins/day) of their waking hours sedentary on workdays and 61% (504mins/day) on non-workdays. 77% (493mins/day) of working hours and 73% (323mins/day) of non-working hours were spent sedentary on workdays. The proportion of time spent sedentary during working hours was underestimated when assessed using the ActiGraph (55% time, 276mins/day).

Conclusions:

Bus drivers accumulate high volumes of sedentary behavior during and outside working hours on workdays. In comparison to the ActivPal, the ActiGraph substantially underestimated drivers' sedentary time during working hours, possibly due to the bus vibrations, making it an invalid measure of sedentary time within this population.

P134

Associations of overall sitting time and sitting time in different contexts with depression, anxiety, and stress symptoms

Authors:

Amanda Rebar, Corneel Vandelanotte, Jannique van Uffelen, Camille Short, Mitch Duncan

Purpose:

Spending a lot of time sitting has been linked to depressive symptoms and spending a lot of time engaging in screen-based sitting has been linked to poor mental health. The purpose of this study was to examine whether overall sitting time and time spent sitting in different contexts was associated with depression, anxiety, and stress symptoms.

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Methods:

Sitting time (time spent sitting on typical work- and non-work days while engaged in leisure activities, working, using a computer, watching television, and in transport), sex, age, income, education, presence of chronic conditions, physical activity and symptom severity of depression, anxiety and stress were self-reported in a cross-sectional online survey in 2012 by Australian adults (N = 1,104). Associations were examined using negative binomial regression analyses.

Results:

Overall sitting time was significantly associated with more severe depression ($b=0.01$; 95% CI: 0.00-0.02) and anxiety ($b=0.03$; 95% CI: 0.02-0.04) but not stress ($b=0.01$; 95% CI: -0.00-0.02) symptoms. Time spent sitting while at a computer was associated with more severe depression ($b=0.04$; 95% CI: 0.01-0.07) and anxiety ($b=0.03$; 95% CI: 0.00-0.06) symptoms, and time spent sitting while in transport was associated with more severe anxiety ($b=0.09$; 95% CI: 0.05-0.13) and stress ($b=0.05$; 95% CI: 0.02-0.08) symptoms.

Conclusions:

Limiting overall sitting time and time spent sitting while at a computer or in transport could be a potential strategy to improve mental health.

P135

How to promote less sitting: How Australian adults rated likelihood to adhere to public health sitting messages

Authors:

Amanda Rebar, Mitch Duncan, Jaclyn Maher, Camille Short, Jannique van Uffelen, Corneel Vandelanotte

Purpose:

The aim of this paper was to investigate Australian's impressions about whether they would adhere to various messages promoting limiting sitting time and to investigate how demographic characteristics, sitting time, and psychosocial sitting time constructs impacted the likelihood of adherence.

Methods:

Australian adults (N=1,648) completed an online survey in which they reported their likelihood of adherence to seven messages promoting limiting sitting time and two messages promoting physical activity using the response scale ranging from 1 (not at all likely) - 5 (very likely). Data analyses included Multivariate Analysis of Covariance.

Results:

People reported that they were least likely to adhere to, 'Sit as little as possible on all days of the week ($M=3.20$, $SD=1.17$)', 'Move as much as possible on all days of the week ($M=3.98$, $SD=0.99$)', and 'Avoid sitting for more than 2 hours daily in your leisure time ($M=3.53$, $SD=1.20$)', and most likely to adhere to 'Stand and take a break from sitting as frequently as you can ($M=4.15$, $SD=0.93$)', and 'Avoid sitting for more than 10 hours during the entire day ($M=4.28$, $SD=1.11$).' Many moderating effects were found.

Conclusions:

As the evidence for the health benefits of sitting time continues to accrue, attention should also be directed toward how best to portray messages about sitting to the public and ensure the messages are relatable to a wide audience. Specific, approach-focused language may be the most effective.

P136

Weight loss maintenance in adults: A qualitative evaluation of the WILMA trial

Authors:

Sharon Simpson, Chris Shaw, Yvonne Moriarty, Liz Randell, Aude Espinasse

Purpose:

Weight loss maintenance interventions have had limited effectiveness with weight regain common. We conducted a 3 arm RCT to assess a 12 month individually tailored intervention to support participants' weight loss maintenance. The WILMA intervention is based on two key features; Motivational Interviewing (MI) and self-monitoring. We interviewed

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participants as part of the process evaluation of the trial.

Methods:

We completed 47 interviews with participants. Participants were sampled across key factors including; trial arm, gender, age and attendance levels. The data were analysed using a framework approach. 10% of transcripts were double coded to check the reliability of the coding.

Results:

Key themes identified include the impact of weight gain/loss on themselves and their family, views of the intervention and research processes, perceptions of maintenance and weight management strategies. Individuals described long struggles with their weight, their attitudes to and relationship with food, factors motivating them to lose or keep weight off including realising the health risks associated with obesity. They described barriers to weight maintenance including environmental and social influences. Participants described how the MI sessions helped them understand the reasons for their eating patterns and helped them to set goals. Ongoing support, planning, self-monitoring and maintaining motivation were seen as key to weight loss maintenance.

Conclusions:

This is the first trial of motivational interviewing in a community based sample of individuals who have lost weight. Participants were generally positive about taking part in the study and outlined the impact the trial had on them and their families.

P137

The attitudes, intentions, perceptions and behavior of obese people in relation to their weight, Western Australia

Authors:

Christina Pollard, Rose Meng, Alison Daly

Purpose:

To identify obese adults' perceptions of their current weight, weight loss intentions and actions and knowledge of the health problems associated with being overweight among the Western Australian population.

Methods:

The 2009 and 2012 Health Department's Nutrition Monitoring Survey Series cross-sectional CATI survey of a random sample of 2,832 adults 18-64 years measured attitudes, beliefs and behaviors about Australian Dietary Guidelines. Data was pooled, weighted for sample design and post adjusted for age, sex and geographic area. Self-reported height and weight, perceptions and weight loss intentions and knowledge of health risks of excess weight were measured. BMI was adjusted for over-reporting of height and under-reporting of weight. Pearson Chi Square and Adjusted WALD tests were used to determine statistically significant differences. Health Department granted ethics approval. Response rate was 89% in 2009 and 82% in 2012.

Results:

Only 22% classified as obese thought they were 'very overweight', 68% viewed themselves as 'somewhat overweight' or 'about right' (10%). Obese respondents were significantly more likely to have tried to lose weight in the last year 80.4% [75.7,84.4] compared to those overweight 60.2 % [56.3,64.1]. More physical activity (63%), changing eating habits (41%) and smaller portions (18%) were weight loss strategies. Heart disease (77%), diabetes (34%) and high blood pressure (30%) were health problems identified.

Conclusions:

Unrealistic body weight perception and a lack of knowledge of health risks associated with overweight may undermine weight loss intentions. Understanding actions taken to reduce weight is critical to developing effective obesity interventions.

P139

How is bariatric surgery patients' weight loss history related to preoperative weight loss?

Authors:

Irmelin Bergh, Hilde Rissstad, Falko Sniehotta, Ingela Kvalem

Purpose:

Before bariatric surgery a weight loss of 5-10% is strongly recommended to improve metabolic control and for patients to prove ability to change behavior. Preoperative weight loss is associated with weight loss after surgery. There is little knowledge about what predicts preoperative weight loss. Since weight loss history may affect self-efficacy and future weight loss attempts, our purpose was to investigate how bariatric surgery patients' weight loss history and self-efficacy is related to preoperative weight loss.

Methods:

In this longitudinal study 221 patients (76.5% women), mean age 43.8 years, underwent Roux-en-Y gastric bypass. Weight was obtained at three time-points before surgery. Participants answered questions about diet and weight loss history extracted from Survey for Eating Disorders, Weight and Lifestyle Inventory, besides the General Perceived Self-efficacy Scale.

Results:

Mean preoperative weight was 131.9 kg (SD 23.5), mean percent total weight loss was 3.44 % (SD 6) and 40.6% of the patients reached the 5 % goal. Number of diet strategies and weight loss attempts were not associated with weight loss. Linear regression analysis revealed that having lost more weight before seeking surgery predicted less weight loss while waiting for surgery. Lower self-efficacy was significantly correlated with both more diet attempts and diet strategies used, but self-efficacy did not predict preoperative weight loss.

Conclusions:

Our findings indicate that many patients fail to lose the recommended weight before surgery. It seems that having lost weight before applying surgery makes it more difficult to continue losing weight. Knowledge about what predicts successful preoperative weight loss is needed.

P140

Waste the Waist: A pilot randomised controlled trial and process evaluation of a theory based intervention to support weight loss through change in diet and physical activity for people with high cardiovascular risk

Authors:

Colin Greaves, Afroditi Stathi, Fiona Gillison, Paul Bennett, Prasuna Reddy, James Dunbar, Rachel Perry, Gordon Taylor

Purpose:

1. To assess the feasibility of delivering the Waste the Waist intervention in UK primary care and of conducting a full-scale randomised controlled trial. 2. To examine the underlying theory.

Methods:

Patients with high cardiovascular (CV) risk were identified using practice database searches and randomised to receive usual care (Controls) or nine Waste the Waist sessions (Intervention). Weight, physical activity (accelerometry) and CV risk markers (blood tests) were measured at 0, 4 and 12 months. Process questionnaires were used to test the underlying theoretical model.

Results:

108 people (22% of those approached) were randomised, with 89% and 85% providing data at 4 and 12 months. Participants' mean age was 65 and 70% were male. The intervention group lost significantly more weight than controls at 12 months (ITT Mean Diff = -2.3Kg, 95%CI: -4.4 to -0.3). Significant changes were observed in dietary intake but not physical activity. Analysis of process measures broadly supported the underlying theory. However, important variations were noted (social support and perceived importance of change were not related to behavioral or weight loss outcomes). Additional (non-model) processes (understanding the process of behavior change, impulsive and affective processes) were also associated with weight loss at 12 months.

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Conclusions:

The Waste the Waist intervention is deliverable in UK primary care, has acceptable recruitment and retention rates and produces weight loss. It is ready (with some refinements suggested by our process analysis) for evaluation in a full-scale trial.

P141

Results of a randomized controlled trial evaluating the effect of a multi-component intervention aimed at portion size on body mass index

Authors:

Maartje Poelman, Emely de Vet, Elizabeth Velema, Michiel de Boer, Jaap Seidell, Ingrid Steenhuis

Purpose:

This study sought to determine the effects of a multi-component educational intervention “PortionControl@HOME” on body mass index (BMI) and portion control behavior.

Methods:

Overweight and obese participants (N=278) were randomly assigned to a three-month intervention or wait list control condition. The aims of the intervention were to 1) increase portion size awareness; 2) enhance self-regulation skills regarding portion control; 3) improve portion control cooking skills; and 4) support creating a portion size friendly home environment. The primary outcome, BMI and secondary outcomes including portion control behavior were assessed at baseline and at 3, 6 and 12 months follow-up. Multi-level regression and mediation analysis were conducted following intention to treat principles.

Results:

At three months follow-up, the intervention group had a greater weight loss of 0.42 BMI-points compared to the control group (95% CI: -0.91 to 0.07), although this difference was only statistically significant when outliers (n=3) were removed from the analysis (B= -0.45, 95% CI: -0.88 to -0.04). Weight loss was mediated by portion control behavior. No intervention effects were observed at six and twelve month follow-up.

Conclusions:

A portion control education intervention was effective at reducing BMI; however once the intervention ceased, sustained effects on body mass were no longer evident. A prolonged intervention period or including relapse prevention strategies may improve longer term effects of educational interventions aimed at reducing portion sizes.

P142

Wildcat Wellness Coaching Trial: Preliminary evaluation of a home-based, wellness coaching intervention on diet and body composition

Authors:

Richard R. Rosenkranz, Brooke J. Cull, Sara K. Rosenkranz, Matt Powell, David A. Dzewaltowski

Purpose:

Wellness coaching appears promising for improving health behaviors, but no extant study has assessed its application for childhood obesity prevention in the home environment. This study evaluated the preliminary effectiveness of home-based health behavior coaching as an obesity prevention intervention strategy.

Methods:

Girls (n = 21, mean age = 11.1 ± 1.3yrs, body mass index ≥85th percentile) were randomized to receive healthful eating and physical activity skills (HEPA skills) wellness coaching or a standard-care health education condition. Both interventions were delivered (60 min weekly for 12wks) by trained college-aged female coaches in the home setting. HEPA skills focused on enjoyable physical activity, healthful snack recipes, goal setting, self-monitoring, role modeling and social support. Body fat and diet were assessed via DEXA and the Children’s Dietary Questionnaire, respectively. Paired samples t-tests and univariate ANOVA were used to investigate differences between baseline and post-intervention time points across trial arms.

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Results:

Both intervention arms showed small decreases ($-1.02 \pm 2.03\%$, $p = 0.032$) in body fat percentage; small increases in self-reported fruit consumption (0.95 ± 1.61 days/week; 0.85 ± 1.04 times/week $p = 0.016$); and increases in parental fruit and vegetable requests (0.40 ± 0.75 parental requests/week, $p = 0.028$) from baseline to post-intervention, but there were no differences between conditions ($F_{1,19} = 3.10$, $p = 0.094$).

Conclusions:

Both home-based wellness coaching interventions impacted diet and body composition in overweight girls. Further evaluation of these interventions compared to a no-treatment control group via fully powered randomized controlled trial is warranted.

P143

Cost-effectiveness of two intensities of a combined lifestyle intervention aimed at improving physical activity and nutritional behavior

Authors:

Marieke Hendriks, Brenda Berendsen, Evert Verhagen, Stef Kremers, Hans Savelberg

Purpose:

We studied the cost-effectiveness a combined lifestyle intervention to improve physical activity and nutritional behavior; a start-up program comprising 6 physiotherapy sessions versus a supervised program comprising 32-41 physiotherapy sessions. The purpose is to increase quality of life and reduce healthcare utilization and subsequent costs in adults with overweight and obesity.

Methods:

In a clustered RCT (29 clusters; $n=411$) participants allocated to the control locations received start-up program and those allocated to the intervention group the supervised program. Healthcare utilization and clinical outcomes were assessed by means of self-administered questionnaires every three months during one year. A cost-effectiveness and cost-utility analysis was done from a healthcare perspective with a time horizon of 12 months. Differences in costs and effects are presented in Incremental Cost-Effectiveness Ratios. Uncertainty was assessed by means of 1000-times bootstrap and sensitivity analyses.

Results:

Baseline characteristics were comparable between the groups. Program costs of the supervised program were higher compared to the start-up program, but other healthcare costs during 12 months follow-up were lower for the supervised program. Utilities increased in both groups, and one-year QALYs were somewhat higher in the supervised program. The ICER showed that the supervised program was related to additional costs and effects, which was confirmed by bootstrap and sensitivity analyses.

Conclusions:

The more expensive supervised program showed less healthcare utilization, and only slightly higher total costs with some additional effects compared to the start-up program. The supervised program is perceived to be cost-effective from a healthcare perspective after one year follow-up.

P144

Driving to be obese: A systemized literature review on the association between driving time and distance and weight status in adults

Authors:

Jagdeep Virk, Gavin McCormack

Purpose:

Higher levels of sedentary behavior (i.e., screen-time, sitting, and driving behavior) are associated with adverse health in adults. In particular, over-reliance on private motor vehicles for transportation is implicated as a likely contributor to the obesity epidemic. The objective of this study was to undertake a systematized literature review on the relationship between motor vehicle driving distance and time and weight status among adults.

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Methods:

To identify relevant primary peer-review articles, keywords associated with driving behavior and weight status were entered into four databases (PubMed, Medline, Transportation Research Information Database, and Web of Science). Two independent reviewers screened study titles and abstracts for relevance. Relevant articles were read in full to assess their eligibility for inclusion in the review (i.e., English-language articles, included a sample ≥ 16 years of age, included a measure of driving time or distance as driver or passenger of a private motor vehicle, included a measure of weight status, and provided a quantitative estimate of the association between driving and weight status).

Results:

The database search yielded 2502 articles, from which 86 were deemed relevant, and 9 studies met the inclusion criteria. Of the 9 studies included in the review, 6 found a statistically significant positive association between driving time or distance and weight status.

Conclusions:

Increased driving time and distance appears to have undesirable consequences on weight status in adults. Multilevel interventions that make alternatives to driving private motor vehicles more attractive and convenient are needed to promote healthy weight in the adult population.

P145

Daily sedentary behavior, physical function, and health-related quality of life in community-dwelling older women

Authors:

Saori Ishikawa, Joel Reece, Meghan Mace, Youngdeok Kim, Minsoo Kang, Don Morgan

Purpose:

To quantify the impact of reducing sedentary behavior (SB) on instrumental activities of daily living (IADL) and health-related quality of life (HRQOL) in free-living older women.

Methods:

Daily SB was assessed in 22 retired females (> 60 years of age) using a waist-mounted accelerometer with a cutpoint of less than 100 counts per minute (cpm). Accelerometry non-wear time was defined as a time frame containing at least 60 consecutive minutes of 0 cpm, with allowance made for one to two minutes of accelerometer activity of up to 100 cpm. Valid days were defined based on a minimum of 10 hours of wear time per day. Raw values of daily SB were adjusted based on daily wear time and the amount of reduction in daily SB was computed following a 4-week period during which prolonged bouts of SB were replaced with shorter bouts of light-intensity activity. Physical function was assessed using the IADL scale and HRQOL was evaluated using the RAND-36 Health Survey Version 1.0. Changes in SB, IADL, and HRQOL were computed by subtracting pre- intervention from post-intervention values.

Results:

While no relationship was noted between reductions in daily SB and IADL scores ($r = .13$, $p = .586$), a significant positive association ($r = .44$, $p = .041$) was observed between the amount of reduction in daily SB and improvement in HRQOL.

Conclusions:

Our findings suggest that reducing daily levels of SB improves HRQOL in community-based older females.

P146

Physical inactivity and health risks for taxi drivers

Authors:

Kate Murray, Abdimalik Buul, Ahmed Aden, Amelia Eastman, Harvey Checkoway

Purpose:

Limited research, largely done outside the U.S., suggests taxi drivers face unique health risks due to their occupational exposure to chronic sedentary behavior and work-related stress. The goals of this research were to collect formative data on current health challenges and to identify opportunities for interventions for East African taxi drivers, who represent 70% of the San Diego taxi workforce.

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Methods:

Formative research was conducted with a convenience sample of 19 East African taxi drivers in June 2013. Drivers completed a 1-page questionnaire then participated in one of three focus group discussions lasting approximately 1.5 hours.

Results:

The focus groups highlighted the health sequelae related to sedentary behavior and work conditions, including chronic pain, hypertension, diabetes, and kidney disease. Participants reported limited information and resources as barriers for them seeking physical activity during non-work hours. Numerous systemic barriers were also identified, including regulations that prohibit drivers from moving more than 12 feet away from their cab, a lack of a mobile dispatch system in San Diego, and lack of health benefits (e.g. health insurance, sick days). Despite the numerous barriers, drivers expressed their desire for more health and physical activity programs and advocacy to promote a healthier work environment.

Conclusions:

Given high levels of musculoskeletal concerns and chronic disease, there is a need for interventions to decrease sedentary behavior while being sensitive to the unique occupational factors associated with taxi driving. Within a highly unregulated industry, there is a need for interventions that address individual and industry-level reform.

P147

Addressing sedentary behavior: The EuroFIT project

Author:

Hidde van der Ploeg, on behalf of the EuroFIT team

Purpose:

Sedentary behavior is a risk factor for cardiovascular disease, diabetes and cancer. Lifestyle programmes aimed at improving physical activity (PA) and dietary behaviors tend to have small reductions in sedentary behaviors at best. Interventions that also specifically address sedentariness could reap significant health benefits from improving all three behaviors. The EuroFIT project will therefore target sedentary behavior along with PA and diet in a healthy lifestyle programme for men.

Methods:

EuroFIT is a European project with eleven partners from the UK, the Netherlands, Norway, Portugal and Republic of Ireland. It aims to develop and evaluate a lifestyle programme for male football fans aged 30-65 who do not achieve national PA guidelines by expanding on the success of the Football Fans in Training model in Scotland. Fifteen professional football clubs from the English, Dutch, Norwegian and Portuguese Premier Leagues (including Arsenal, Manchester City, FC Utrecht, FC Feyenoord, Benfica and FC Porto) will participate in the intervention development and subsequent evaluation in a randomized controlled trial.

Results:

The presentation will focus on the development of the sedentary behavior component of the EuroFIT project. It will discuss how state-of-the-art sedentary behavior interventions can be integrated in a lifestyle programme delivered through the professional sports club setting. The development of a self-monitoring tool for sedentary behavior (the sitFIT device) as part of the EuroFIT intervention will also be discussed.

Conclusions:

EuroFIT provides new insights into delivering healthy lifestyle programmes to high risk, hard-to-reach groups through professional football clubs.

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Sedentary time and depressive symptoms in adults: Exploring moderators

Authors:

Jacqueline Kerr, Dori Rosenberg, Jordan Carlson, Brian Saelens, Neville Owen, Kelli Cain, Terry Conway, James Sallis

Purpose:

To examine the associations of weekday and weekend day sedentary time with depressive symptoms and explore employment status and demographic variables as moderators.

Methods:

Participants (N = 884; Mean age = 46.0 SD 10.5) were recruited from neighborhoods varying by walkability and income. Participants wore Actigraph accelerometers for 7 days. Daily average sedentary time (counts per minute <100) was calculated for weekdays and weekend days. Sedentary minutes were dichotomized as 8+ hours or <8 hours/day. Participants completed a measure of depressive symptoms (CES-D) which was dichotomized to reflect whether they had mild to moderate depressive symptoms (>10 points) or not. Generalized linear mixed models assessed interaction effects between depressive symptoms and sedentary time by work status and other demographic variables, adjusting for neighborhood clustering, study region, vehicle ownership, physical activity, and BMI.

Results:

Weekend sedentary time and depression were not related. There was a significant negative relationship for weekday sedentary time and a significant ($p < .01$) three way interaction between sedentary time, marital status, and employment status. Those averaging 8+ hours of weekday sedentary time who worked but were not married were significantly less likely to be depressed (OR = 0.52, $p = .002$). The relationship between sedentary time and depression was not significant but was positive (OR = 1.2) in married workers.

Conclusions:

Some studies have shown that sedentary behavior may be related to poorer mental health. In this diverse adult population sample, however, a sedentary working life was related to fewer depressive symptoms in those who were not married.

E-health

P149

Adherence to components of an E-health intervention and change in adolescent BMI z-scores

Authors:

Louise C. Masse, Andrew Tu, Allison W. Watts, Jean-Pierre Chanoine, Constandina Panagiotopoulos, Josie Geller, Rollin Brant, Susan I Barr

Purpose:

The purpose of this paper was to investigate whether adolescent and parental adherence to multiple components (i.e., login, counseling, and self-monitoring) of an E-health intervention resulted in greater change in BMI z-scores in a population of overweight/obese adolescents.

Methods:

160 overweight/obese adolescents participated in an 8-month E-health lifestyle familial intervention that is based on the Chronic Care Model, Social Cognitive Theory, and the Transtheoretical Model. Each week, adolescents and their parents were asked to login to their respective individual website. Adolescents received counseling phone calls from the research team at weeks 2, 4, 8, 12, and 16. We examined adherence to: Login (average percentage of webpages viewed weekly [adolescents]/number of weeks logged in [parents]); self-monitoring (number of weeks behaviors were tracked); and counseling (number of counseling calls completed [adolescent only]). Multivariable regression analysis was used to examine predictors of adolescent adherence and change in BMI z-score.

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Results:

On average, adolescents and parents completed 28% and 23%, respectively, of the online component of the intervention. Parent login ($b = 0.018$; $SE = 0.002$; $B = 0.653$) and parent self-monitoring ($b = 0.553$; $SE = 0.098$; $B = 0.465$) were significantly associated with adolescent login and self-monitoring, respectively. Adolescent login was significantly associated with change in BMI z-score at eight months ($b = -0.392$; $SE = 0.154$; $B = -0.355$).

Conclusions:

The results highlight the importance of parental participation on adolescent adherence to an E-health intervention. Increased adolescent adherence was associated with a decreased BMI z-score in this study. Future lifestyle modification interventions should include parental participation.

P150

Exploring women's beliefs and perceptions about healthy eating blogs: A qualitative study

Authors:

Véronique Bissonnette-Maheux, Véronique Provencher, Annie Lapointe, Marilyn Dugrenier, Audrée-Anne Dumas, Sharon Straus, Gagnon Marie-Pierre, Sophie Desroches

Purpose:

To identify women's salient beliefs and perceptions regarding the use of a healthy eating blog to improve their dietary habits.

Methods:

Focus groups were conducted with 29 women living in the Quebec City metropolitan area, aged 18 years and older (mean 44 ± 17 years). In advance of the focus groups, women explored four healthy eating blogs written by a dietitian to prepare them to discuss their perceptions toward blogs. Using the three constructs of the Theory of Planned Behavior, we identified salient beliefs of women underlying their attitudes (advantages/disadvantages), subjective norms (people that would approve or disapprove), and perceptions of control (facilitators/barriers) with regard to their use of a healthy eating blog to improve their dietary habits. Interviews and focus group discussions were audiotaped, transcribed verbatim, coded and analyzed with NVivo 10 software by two individuals independently.

Results:

The most frequently cited advantages of the blogs were that they: Provide recipe ideas, help improve their lifestyle and facilitate interaction with a dietitian. Family, friends, colleagues, and, physicians were identified as important people that could both approve or disapprove of the use of a blog by the participants. Facilitators and barriers to the use of a blog that were most cited included: Receiving new nutrition information including recipes regularly, and reading entertaining posts.

Conclusions:

Identifying the salient beliefs underlying women's attitudes, subjective norms, and perceptions of control with regard to healthy eating blogs provides an empirically-supported basis for the design of effective knowledge translation interventions in nutrition.

P151

Empowering youth: How can we develop and run a wellbeing campaign by-youth-for-youth?

Authors:

Jule Kunkel, Scott Duncan, Lesley Ferkins, Aaron Jarden, Grant Schofield

Purpose:

While youth are highly vulnerable for unhealthy lifestyle choices, they represent a promising target group for social marketing - if they are involved from the formative stage. Overarching research question is how a social marketing campaign by-youth-for-youth can promote change in lifestyle attitudes and behaviors in a secondary school setting. But what are health attitudes and behaviors in this target group? How can we develop and implement a campaign in collaboration with youth? What does this campaign look like?

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Methods:

Action research caters for a participative methodology. Setting is one High School of 2,700 students over one year. Methods for the four phases of issue identification and analysis, planning and taking of action, and evaluation and reflection comprised focus groups, meetings, interviews and surveys.

Results:

The qualitative methods used in the development phase were evaluated as highly useful, engaging and successful tools to empower students, ignite passion and involvement, and develop a comprehensive marketing campaign. Interviews and observations showed high awareness of the campaign and positive effects on those with highest involvement. The action phase revealed practical barriers in the implementation and students' planning passion could not translate into the implementation. Leading students showed critical reflection, remained praising the campaign, emphasising its necessity for their peers.

Conclusions:

All tools were highly useful and successful to create a comprehensive wellbeing campaign. More time is needed for a further evolution of the campaign. While social media were crucial, it needed to be complemented with onsite presence to create awareness and sympathy.

P152

A 6-month randomized trial to improve nutrition behaviors using mobile devices and tailored text messaging in young adults - more effective in men than women

Authors:

Deborah Kerr, Amelia Hanbury, Christina Pollard, Peter Howat, Satvinder Dhaliwal, Edward Delp, Mark Pickering, Carol Boushey

Purpose:

Conduct a randomised trial to evaluate the effectiveness of using a mobile device to collect food intake, provide tailored dietary feedback and nutrition messages about fruit, vegetable, and energy-dense nutrient poor foods (ED-NPF) delivered via text messaging to promote dietary change among a population-based sample of young adults (18-30 years).

Methods:

Participants used a mobile device, 4-day image-based dietary record (MDR) prior to being randomized to: Group A: MDR + dietary feedback + weekly text messages; Group B: MDR + dietary feedback or Group C: MDR, no feedback. We categorized the fruits, vegetables and EDNP foods into serves from MDRs. One serve of EDNP was equivalent to 600 kJ. The intervention was based on self-determination theory and motivational interviewing. GLM was used to assess changes.

Results:

Of the 247 participants, 220 (89%) completed the intervention and both MDRs. The mean BMI was $24.0 \text{ kg/m}^2 \pm 5.5$ and $24.6 \text{ kg/m}^2 \pm 4.5$ among the 149 women and 71 men, respectively. There was no effect of the intervention on serves of fruits and vegetables. Men in both intervention groups ($n=49$) recorded a significant reduction ($P=0.036$) in EDNPF serves (-0.848 ± 0.40) compared to the control group ($n=22$).

Conclusions:

The intention of the intervention was to be equally effective in men and women. The positive effect among men for EDNPFs was an unexpected finding and suggests that men may be more receptive to interventions delivered via mobile devices. This low-cost, innovative approach may provide an efficient delivery for health promotion programs to reach populations, particularly young adult men.

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Participation, completion and outcomes of online programs for parents and children to reduce childhood obesity

Authors:

Marilyn Frenn, Jane Kotchen, Janet McMahon, Julia Snethan, Laura Tudor, Elizabeth Jaruseski, Sarah Burkel, Nina Nosovan

Purpose:

To examine the feasibility and initial outcomes of online programs for parents and children to reduce child obesity.

Methods:

Randomized controlled feasibility study. Measures included: body mass index percentile (BMIp), body fat percentage measured by bioimpedance. Subjects (N= 99; 49.5% female children; 61.2% mothers; 68% Caucasian, 9% Hispanic, 8% African American, 5% other) were recruited through worksites, after school programs, the YMCA, and at school forms and fee days. Parent BMI M=29; age =38. Children were ages 8-14 (4% underweight, 52% normal weight, 19% overweight and 25% obese).

Results:

Across sites 38% of children and 20% of parents completed the online programs. An employer-based wellness coalition was engaged to recruit parents through worksites. African American 9%, Caucasian 71%, and Latino 5% comprised the race/ethnic identification. Children (57% female) were 62% normal weight, 19% overweight and 19% obese. Parents (85% mothers) were 32% normal weight, 16% overweight, and 53% obese. The YMCA program included those who did not do a face-to-face program, so were offered the online program as an alternative. These parents (n=6) and children (n=9) were all obese and none finished. The after school programs yielded the greatest number of participants (including the greatest overall numbers of overweight and obese children and more Latinos).

Conclusions:

It is important to address overweight and obesity in childhood because 80% of children overweight at age 10 to 15 are obese at age 25. Worksite recruitment yields an obese group of parents, greater numbers and diversity of children are recruited through schools.

P154

Understanding obese adolescent experiences of text messaging as a support following a healthy lifestyle intervention

Authors:

Kyla Smith, Leon Straker, Deborah Kerr, Ashley Fenner, Erin Howie

Purpose:

To explore the opinions of obese adolescents and their parents regarding the use of text messages as a support during the maintenance period following an intervention.

Methods:

Focus groups were conducted with obese adolescents (n=12) and parents (n=13) three months after they had completed the intensive phase of Curtin University's Activity, Food and Attitudes Program (CAFAP). Participants were asked about their experiences of the prior 3-month maintenance phase during which adolescents had received tri-weekly text messages about healthy eating, physical activity and sedentary behavior based on self-determination theory and goal-setting theory. Data were analyzed using content and thematic analyses.

Results:

A theme emerged from the focus groups relating to inconsistencies between what adolescents thought they wanted in text messages to support behavior change and how they changed behavior in response to text messages. Adolescents described a preference for casually worded text messages that included healthy tips or reminders about long-term goals, yet reported they rarely acted upon these messages. A second theme emerged regarding feelings of shame associated with receiving behavioral change text messages and perceived unfavorable comparison with other adolescents. Parents reiterated the sense of shame experienced by their adolescents in response to a number of text messages reminding them about healthy behaviors.

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Conclusions:

The results from this study suggest that researchers and practitioners cannot rely on pre-intervention testing for an accurate understanding of obese adolescents' experiences of text messaging interventions. Obese adolescents face unique issues, which should be accounted for in intervention maintenance periods using text messaging.

P155

The STRIDE study: An online lifestyle intervention for cancer survivors

Authors:

Lauren Frensham, Gaynor Parfitt, Dorota Zarnoweicki, Rebecca Stanley, James Dollman

Purpose:

Cancer survivorship rates have increased in developed countries largely due to population ageing and improvements in care. Survivorship is a neglected phase of treatment and is often associated with adverse physical and psychological effects. There is a need for broadly accessible, non-pharmacological measures that may prolong disease-free survival, reduce co-morbidities and enhance quality of life. The Steps Toward Improving Diet and Exercise (STRIDE) study aimed to evaluate the effectiveness of an online-delivered intervention to improve diet and increase walking in cancer survivors.

Methods:

A 12-week quasi-randomised controlled trial was implemented in cancer survivors in metropolitan (n=35) and rural (n=34) South Australia. Intervention and control groups were provided with a pedometer, and the intervention group had access to the STRIDE website where they reported daily steps, affect and ratings of perceived exertion during exercise. These variables were used to individualise weekly step goals to increase walking. Seven day sealed pedometer data and anthropometric measures were collected at baseline and post-intervention.

Results:

Both intervention and control groups increased daily steps and decreased waist girth (both $p < 0.01$) between baseline and post-intervention. The treatment by time interaction was non-significant for both outcome variables; however there was a trend for a larger increase in steps in the intervention group (32% versus 19%) and a larger decrease in waist girth in the intervention group (-1.4% versus -0.7%).

Conclusions:

This study suggests that pedometers are effective for increasing regular walking in cancer survivors and that perceptually regulated, individualised goals may enhance participant response.

P156

Effects of prebiotic fiber and online program on obesity risk factors in Latino and African American 4th and 5th grade students

Authors:

Marilyn Frenn, Nita Salzman, Ana Kisin, Ellen Flaherty, Laura Tudor, Elizabeth Jaruseski, Sarah Burkel, Qiyan Mu

Purpose:

To examine the feasibility and initial outcomes of a prebiotic fiber (inulin/oligofructose) offered in orange juice with calcium or skim milk school days for 12 weeks in addition to an 8 module Health Promotion/Translational Model program on obesity risk factors in (N=123 56% male; 3% underweight; 49% normal weight; 22% overweight; 25% obese) predominately Latino and African American 4th and 5th grade students as compared to a usual class control group.

Methods:

Cluster randomized controlled pilot study. Measures included: Body mass index percentile (BMIp), body fat percentage measured by bioimpedance, dietary fat, and physical activity measured by self-report.

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Results:

All assigned to the intervention classrooms completed without problems related to increased fiber intake. In this sample size the only statistically significant difference was that the control group increased height more than the intervention group, confounding BMI_p results. Percentage body fat and dietary were reduced, and physical activity was increased for the intervention group, which reduced calories, total and saturated fat intake. By the end of the intervention no children were in the obese classification.

Conclusions:

The combination of prebiotic fiber and an online intervention is feasible and shows promising initial results in children with high rates of obesity. It is important to address overweight and obesity in childhood because 80% of children overweight at age 10 to 15 are obese at age 25. Obesity is most prevalent among those with low income, who do not finish high school, so intervening in schools reaches those most at risk.

P157

A team-based online social networking physical activity intervention for women with young children: Piloting and usability testing

Authors:

Jocelyn Kernot, Tim Olds, Lucy Lewis, Carol Maher, Lauren Frensham

Purpose:

Facebook's saliency, ability to target social networks and 24-hour availability offers potential for the delivery of health interventions. This study aimed to pilot the 'Mums Step It Up' Facebook app, a novel physical activity intervention for women with young children.

Methods:

A purposive sample of six "Captain" women with children under five years were recruited via personal contacts. These women used the app to recruit three to seven of their Facebook friends (with children under 5 years) to join their team to participate in a 28-day pedometer challenge. Participants (n=25) were provided with a pedometer and encouraged to use the app to log daily steps, communicate with team mates, and track their progress. Physical activity was assessed at two time points (baseline and three weeks) using the Active Australia Survey. User retention and engagement were determined via usage data. Usability testing with "Captain" women took place over two face-to-face sessions. A feedback survey seeking participants' opinions of the app was completed at time point two.

Results:

Participants' total physical activity increased by an average of 177 minutes ($p=0.01$) from baseline to time point two. On average, participants recorded steps for 25.6 days (SD 4.5) out of 28 and logged on to the app on 13.6 (SD 6.2) occasions during the challenge.

Conclusions:

The 'Mums Step it Up' Facebook app showed considerable promise in assisting women with young children to increase their physical activity. A randomised controlled trial is planned to further investigate its effectiveness.

P158

Engineering online and in-person networks for physical activity: Results of a randomized controlled trial

Authors:

Liza Rovniak, Ding Ding, Christopher Sciamanna, James Sallis, Jennifer Kraschnewski, Stephen Matthews, Chester Ray, Melbourne Hovell

Purpose:

Ecological models indicate that social networks influence physical activity (PA), but few studies have explored how best to engineer online or in-person networks to sustain PA. We conducted a randomized controlled trial to evaluate if prompting online (e.g., Facebook) and in-person social interactions for PA could improve the effectiveness of evidence-based PA programs.

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Methods:

We randomly assigned 308 sedentary adults to three groups: WalkLink+: Feedback on online and in-person interactions for walking, plus 12-week evidence-based walking program and weekly walking tips; WalkLink: 12-week evidence-based walking program and weekly tips only; Minimal Treatment Control: Weekly tips only. Ongoing process evaluations were conducted to ensure treatment fidelity. In-person assessments were conducted at baseline, post-program, and 6-month follow-up.

Results:

At baseline, participants were 61.6% female, 83.4% overweight/obese, and 8.1% non-White, with a mean age of 50.3; 87% and 83%, respectively, completed the post-program and 6-month assessments. Using ANCOVA adjusted for demographics and baseline scores, the Minimal Treatment Control group demonstrated a greater increase in accelerometer-measured light/lifestyle PA from baseline to 6-months (14.1 mins/day), relative to the WalkLink (-9.2 mins/day) and WalkLink+ (-3.0 mins/day) groups ($p < .05$). There were no significant between-group differences at post-test or 6-months in accelerometer-measured moderate/vigorous PA or in objectively-measured aerobic fitness, BMI, and waist circumference.

Conclusions:

Results suggest a need to reconceptualize how best to engineer social networks to sustain PA. Among self-selected adults, a low-dose cost-effective intervention combining weekly walking tips with in-person assessments yielded at least as large an effect on objectively-measured outcomes as more intensive interventions.

P159

Nutrition care in general practice: Doctor and patient perceptions and use of an online computer-tailored communications service

Authors:

Sarah Matthews, Peter Radue, Louise Mainvil

Purpose:

To identify general practitioner (GP) nutrition care practices, and GP and patient perceptions and use of an online computer-tailored communication service aiming to increase adult fruit and vegetable consumption.

Methods:

The needs analysis consisted of an Internet-administered survey among 178 New Zealand GPs and a structured interview with a convenience sample of 30 adult patients. Thirty-seven GPs and nurses were invited to refer patients to the service over four weeks.

Results:

Fifty-one GPs participated in the survey (29% response rate). The majority of patients interviewed (19 of 30) believed that their GP or nurse should advise them to eat fruit and vegetables. Over half of GP respondents (58%) reported that they “often” recommended fruits and vegetables to their patients, but follow-up “seldom” occurred (43%). Most GPs (74%) had a positive initial impression of the computer-tailored service, but believed their patients might not be interested (27%) or lack Internet access (17%). However, most patients (21 of 30) were interested in using the service, and Internet access was high (27 of 30). During the four-week trial, 15 GPs and six nurses referred 58 patients to the service, and most GPs and nurses (20 of 23) wanted to continue referring patients to the service. The majority of patients (59%) accessed the website; 28 patients (48%) completed the first session.

Conclusions:

Patients may not be receiving optimal nutrition care from primary healthcare providers, and GPs and patients support implementing an online computer-tailored nutrition communication service in the general practice setting.

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P160

Developing My Child's Weight: A digital education program that addresses parents' concerns about child's weight

Authors:

Robin Rifkin, Patricia Wamboldt, Barbara Lohse

Purpose:

Despite increased concern about childhood obesity, educational materials are not available for parents concerned about their child's body size, development, and weight. Our purpose was to develop such a program using digital photo frame technology for low-income parents and caregivers of adolescent youth. Nutrition experts in feeding behavior and health communication developed My Child's Weight, based on the Satter Feeding Dynamics Model (fdSatter) and aligned with Health at Every Size (HAES) and Eating Competence (EC) behavioral models.

Methods:

In addition to being attractive and engaging, design considered congruence with resource constrained families, literacy, comprehension, and alignment with empowering weight management models addressing human dignity and self-esteem. The program was developed for a digital photo frame format, a methodology previously used with success in nutrition education. Script development preceded pictorial and design features. Text, graphics selection, design and layout were established using a process that resulted in multiple revisions. Several experts in eating behavior, health communications, fdSatter, HAES and EC reviewed the program for face and content validity.

Results:

Approximately 15 revisions resulted in a 16-slide program that covered 4 areas: Body size differences; letting teens grow into a body that's right for them; and division of responsibility for both feeding and physical activity. Concepts related to teasing, nutrition experts, parent control and acceptance were adjusted in the final revisions.

Conclusions:

Formative development and testing has resulted in a unique nutrition education resource, available in multiple digital formats, appropriate to address a low-income audience concerned with their adolescent child's weight.

P161

Accuracy of the Motorola Defy smartphone for assessing physical activity and distance travelled

Authors:

Scott Duncan, Tom Stewart, Nick Baker, Jon Moon

Purpose:

The onboard accelerometers and global positioning system (GPS) receivers on modern smartphones offer considerable promise for the unobtrusive tracking of physical activity (PA) in population research; however, the accuracy of smartphone sensors for assessing PA is uncertain. The purpose of this study was to compare estimates of PA and distance travelled between a popular smartphone and standalone accelerometer and GPS devices.

Methods:

A total of 13 men and 19 women aged 19-47 years were fitted with a Motorola Defy smartphone (in a vertical holster), an Actigraph GT3X+ accelerometer, and a Qstarz BT-Q1000XT GPS receiver on an elastic belt around the waist. Accelerometer and GPS data were accessed from the Defy sensors using a custom application (ActiPal). Participants moved around a 400 m track at four self-selected speeds (slow walk, fast walk, slow run, fast run) before completing six lengths of lateral sidesteps between two points 20 m apart.

Results:

Compared with the GT3X+, the Defy overestimated the vector magnitude of the raw acceleration forces by $11.9 \pm 8.8\%$, $16.6 \pm 12.1\%$, and $17.6 \pm 11.2\%$ for slow jogging, fast jogging, and side stepping (respectively). Compared with the BT-Q1000XT, the Defy overestimated total distance travelled by $26.9 \pm 19.0\%$, $27.3 \pm 19.5\%$, and $18.6 \pm 14.9\%$ for slow walking, fast walking, and slow jogging.

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Conclusions:

The significant differences between devices indicate that care should be taken when using onboard smartphone sensors to collect PA and positional data for research purposes.

P162

Listening to a podcast about omega-3s, while grocery shopping, results in increased long-term seafood purchases

Authors:

Deepika Bangia, Debra Palmer

Purpose:

This study was designed to assess if listening to a podcast about how to increase the consumption of n-3 rich foods, while shopping, increases seafood purchases.

Methods:

This study employed a repeated measures survey design with a convenience sample of grocery shoppers who indicated they had an interest in learning more about n-3s (N=251). Shoppers were recruited from 20 grocery stores that were geographically dispersed throughout New Jersey. The shoppers completed pre- and post-intervention surveys, and provided demographic information as well as their grocery store loyalty card numbers. Each received \$20.00 for study completion. Seafood purchase data was obtained via shopper card data supplied by the grocery store chain, for the six months prior to and post study intervention. Purchase data for all seafood were examined, as was data regarding salmon and tuna and sardine purchases, as these fish were heavily promoted in the podcast.

Results:

Most participants were female (n=186). Their mean age was 50.3 ± 13.2 . The average number of months in which they purchased seafood increased significantly ($t(250) = -8.82$ $p < .0001$), as did their average number of: Seafood items purchased ($t(250) = -7.26$, $p < .0001$), salmon items purchased ($t(250) = -3.77$, $p < .001$) and tuna items purchased ($t(250) = -4.64$, $p < .0001$). Sardines items purchased approached significance ($t(250) = -1.85$ $p < 0.06$).

Conclusions:

Podcasts may be an effective means of communicating nutrition education messages and result in positive long-term behavior change with regard to shopping for n-3 rich fish.

P163

How does use of an online weight gain tracker relate to satisfaction with the tracker and overall intervention website?

Authors:

Meredith Graham, Margaret Demment, Christine Olson

Purpose:

Weight monitoring is an effective strategy to promote appropriate weight gain during pregnancy. We hypothesized that use of the website is related to satisfaction with the website or particular website features.

Methods:

This study includes racially and socioeconomically diverse pregnant women assigned to the intervention in a randomized controlled trial to prevent excessive gestational weight gain (n=1014). Web site use was automatically collected by the website. A survey to assess satisfaction with the intervention website was conducted after delivery (n=589). Telephone interviews were conducted after delivery to better understand use of intervention features (n=12). Helpfulness and ease of use of the weight gain tracker and overall website satisfaction were measured on a 10 point scale. Associations were assessed using chi-squared analysis.

Results:

From the telephone interviews the weight gain tracker was either the most or least favorite feature. From the surveys, most participants found the tracker: Easy to use (76%) and helpful (55%) and the entire site enjoyable (62%) and

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recommendable (65%). There were significant differences in use by satisfaction, but not across all. In general, participants who were highly satisfied with the website and tracker were most likely to be high or consistent-use participants. Nearly a third of survey respondents were no/low users and 50% of them were highly satisfied.

Conclusions:

Surprisingly, engagement with the website was not dependent on satisfaction with the weight gain tracker or overall website. This is likely due to the high level of satisfaction reported by most women.

P164

Vitamin D intake among young Canadian adults: Validation of a mobile vitamin D calculator 'app'

Authors:

Samantha Goodman, Barbara Morrongiello, Janis Randall Simpson, Kelly Meckling

Purpose:

The purpose of this study was to establish the reliability and validity of the dietary component of a Vitamin D Calculator smartphone 'app'. Using a mobile application to track consumption is an innovative approach that enables users to receive immediate feedback regarding their daily vitamin D and calcium intake and to adjust accordingly.

Design:

During an initial study visit, participants signed a consent form, completed a short socio-demographic questionnaire and were taught how to use the Vitamin D Calculator app. Three recording days and three subsequent study visits were scheduled over one month. Participants entered their dietary intake into the app on the specified recording days; participants underwent a 24-hour dietary recall the day after each recording day.

Participants: 50 young adults, aged 18-25 years (n=25 male; 25 female) living in Guelph, Ontario.

Measures: Socio-demographic survey, 24-hour recall, Vitamin D Calculator application.

Analyses: Bland-Altman plots were used to validate the Vitamin D Calculator data against 24-hour recall data. Pearson correlations were used to examine associations between the two measures. T-tests were conducted to test for differences in mean vitamin D intake between the app and 24-hour recall, and to assess test-retest reliability of the app.

Results:

This study established the validity and reliability of the Vitamin D Calculator app.

Conclusions:

This study contributes to the advancement of the field by validating a measure that could be used in behavioral nutrition interventions as a tool to increase awareness of vitamin D and calcium levels and/or consumption of these nutrients.

School Environment: Effects/Interventions

P165

Characterization of food and beverages sold around public elementary schools in Mexico City

Authors:

Lizbeth Tolentino-Mayo, Erica Soltero, Rebecca E. Lee, Lucie Lévesque, Simón Barquera

Purpose:

To characterize the type of food and beverages sold around public elementary schools at time of entry and exit of school children.

Methods:

An inventory of the food products sold outside entry and exit hours (EEH) of 20 southern Mexico City elementary schools was developed. Data were collected for 625 food items and beverages covering 10 food groups (snacks, beverages, milk/yogurt, prepared foods, fruits, vegetables, natural juices, soy products, fruit juice drinks, other). 'Lunch packs' made up of baguette, sandwich, juice, yogurt, and fruit were considered separately. Price and weight (g or ml)

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were recorded for every product sold. USDA food composition tables and the Mexican nutritional content tables were used to calculate the calorie content of the products.

Results:

A total of 60 stalls, which sold on average 6.02 (SD 4.7) different products were observed. By food group, snacks were the most commonly sold (45%), then beverages (24.2%) and milk or yogurt (16%), and in lower proportion, prepared foods (5.9%), fruits (3.2%), vegetables (2.4%) and lunch packs (2.4%). Of the beverages, only 19% were bottled water and the rest were sweetened beverages (soda, juices, etc.). Lunch packs had an average of 427 kcal. The average cost of the products sold was \$.34 USD.

Conclusions:

Mexico City schools are surrounded by a high availability of products with high-calorie content, like snacks and sugar sweetened beverages. This study is the first in Mexico City to quantify the amount of calories available in products that are sold around elementary schools.

P166

Physical education students' sources of perceived "PE Worth" and "PE Ability": A qualitative approach

Authors:

Toni Hilland, Nicola Ridgers, Gareth Stratton, Stuart Fairclough

Purpose:

The primary purpose of this study was to explore and understand students' thoughts and feelings about school Physical Education (PE). Specifically, information regarding students' sources of perceived "PE Worth" and "PE Ability" in PE was examined. Twelve in-depth focus group interviews were conducted in three secondary schools in the North West of England. Fifty-four students (38 girls; aged 12-14 years) were purposefully selected to participate in this study based on their teachers' normative ratings of their PE Ability. Four sex-specific groups from each school, comprising between 4-5 students, took part in this qualitative study. Focus group topics were developed and based on Welk's (1999) Youth Physical Activity Promotion Model. Interviews lasted between 30-60 minutes; the discussions were recorded by dictaphone and later transcribed verbatim. Analyses were conducted using NVIVO and thematic analysis was employed to interpret the data. Analyses revealed sources of perceived "PE Ability" involved feedback, perceptions of skill, comparison against peers, PE sets and selection. Sources of perceived "PE Worth" included PE teachers, effort-benefit ratio, inherent physicality, changing and showering, skill drills versus games, choice and freedom and the social aspect. On this basis of these findings, PE teachers should provide their students with enjoyable successful experiences, positive feedback, autonomy and choice. In addition, a classroom climate is needed that fosters learning and improvement, rather than competition and winning.

P167

Water drinking in Imperial County, California elementary schools: Availability, policies, and promotion

Authors:

Griselda Cervantes, Hena Din, Kelsie Full, Jamie Moody, Leticia Ibarra, Amy Binggeli, Guadalupe Ayala

Purpose:

The purpose of this study was to assess the availability, policies, and promotion of water drinking in elementary schools in the county with the highest rate of childhood obesity in California. Despite studies demonstrating that drinking more water and fewer sugary beverages is a behavior that may reduce childhood obesity risk, most school wellness policies do not currently address water drinking.

Methods:

Twenty principals completed a 60-minute baseline interview to obtain information about wellness policies. Interview variables of interest were those related to water drinking. This study is part of Centers for Disease Control and Prevention-funded multi-sector, multi-level childhood obesity study, Our Choice/Nuestra Opción, in Imperial County, California, USA.

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Results:

Ninety percent of the schools met the recommended ratio of fountains to people (1 to 150), demonstrating adequate availability. However, 37% of the principals reported that water was not provided with lunch. In terms of policies, 30% of principals reported children were either not allowed or it was the teacher's preference to allow children to drink water in the classroom, while 45% reported that children were allowed to drink beverages other than water. Regarding promotion, only 40% of principals were confident that at least half of their staff role-modeled drinking water.

Conclusions:

Study results suggest that district wellness policies could be refined to support and promote students drinking more water. Future studies should explore effective ways to enforce new policies and promote behaviors that may help reduce childhood obesity.

P168

The role of autonomy and controlling teachers behaviors on pupils needs satisfaction and needs thwarting

Author:

Linus Jonsson

Purpose:

Physical Education (PE) can be of importance for increasing pupils' physical activity (PA) levels, whereas the PE teachers may play an important role in motivating the pupils to engage in PA. Based on the tenets of Self-Determination Theory (SDT), the overall aim of this study is to explore social conditions that satisfies versus thwarts the basic psychological needs of pupils, and in turn impacts well-/ill-being and behavior outcomes in the PE context.

Methods:

A set of SDT-based instruments measuring perceived autonomy supportive/controlling teacher behaviors, needs satisfaction/thwarting, motivation, and physical (in)activity will be distributed to about 200 pupils in grades seven to nine. Structural equation modeling will be used to test a proposed working model.

Results:

On the one hand, it is expected that if the pupils perceive their PE teacher as autonomy supportive this will satisfy the pupils' basic needs, and in turn lead to more self-determined motivation and enhanced well-being. Self-determined motivation will in turn predict healthy behaviors, such as PA. On the other hand, it is expected that if the pupils perceive their PE teacher as controlling this will thwart the pupils' basic needs, and in turn lead to more controlled motivation and greater ill-being. Controlled motivation will in turn predict unhealthy behaviors, such as physical inactivity.

Conclusions:

There is a lack of knowledge in the literature regarding the effects of controlling teachers' behavior on pupils' needs thwarting and ill-being. This knowledge should be considered essential when developing future interventions and educating new PE teachers.

P169

Objectively measured physical activity levels in secondary school physical education lessons: Meeting the mark or a missed opportunity?

Authors:

Rachel Sutherland, Libby Campbell, David R Lubans, Anthony D Okely, Nicole Nathan, Luke Wolfenden, Karen Gillham, John Wiggers

Purpose:

Physical Education (PE) provides an important opportunity for young people to engage in health enhancing physical activity. This cross-sectional study examined the levels of objectively measured physical activity (PA) in secondary school PE lessons. A secondary aim was to determine if student characteristics including sex and weight status were associated with PA levels.

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Methods:

Grade 7 students (12-13 years of age) from 10 Australian secondary schools in low socio-economic areas were invited to wear an accelerometer for 1 week. Data represent recordings for students that wore their accelerometer for at least 3 days, including 100% of at least one PE lesson. The Everson cut-points were used to determine average minutes and percentage of PE lesson time per student spent in sedentary, light, and moderate-to-vigorous physical activity (MVPA). After adjustments were made for clustering, mean minutes of MVPA for student subgroups were compared using t tests.

Results:

1028 students undertook on average 2.2 PE lessons (range 1-5) during the measurement period. On average, students participated in only 6.31 minutes of MVPA per lesson, representing 14.7% of the lesson. Participants were sedentary for 21.0 minutes, representing 50.2% of the lesson. Boys engaged in significantly more MVPA in PE than girls (16.2% v's 12.9% $P = <0.001$). There was no significant difference in MVPA by weight status.

Conclusions:

PE lessons represent a missed opportunity for students to accumulate MVPA. Strategies targeting both teaching methods and students' participation and motivation are needed to improve the contribution of PE to overall activity levels.

P170

Walk Across Texas program implementation in Texas Grow! Eat! Go! schools: Increasing physical activity in students and parents

Authors:

Michael Lopez, Nalini Ranjit, Alice Kirk, Judy Warren, Alexandra Evans

Purpose:

The high prevalence of childhood obesity is a concern because of its link to negative health consequences for children and their families. Schools are uniquely positioned to have a positive impact on children's knowledge and behaviors associated with obesity. Adding more frequent and vigorous physical activities has been shown to improve student fitness and weight. Participants of this session will be introduced to the Walk Across Texas program and its recent findings as a component of the Texas Grow! Eat! Go! project. This session will specifically focus on the implementation of the Walk Across Texas program and the student pre post outcomes related to physical activity.

Methods:

The Walk Across Texas (WAT) intervention was implemented for 1 year in 3rd grade classrooms at 8 low-income schools ($n=310$; Hispanic 42.6%, African-American 19.7%). Intervention was eight weeks of WAT with one session in the fall and one session in the spring. WAT website reports reinforced and supported data obtained by student pre- and post-intervention surveys, teacher surveys, and child BMI data.

Results:

Preliminary results have shown the WAT program to be effective in changing physical activity behaviors in children, as well as encouraging parental engagement. Positive weight changes for the children whose BMI percentile was considered obese or overweight were found in schools.

Conclusions:

The learning objective of this session will be to successfully identify factors of school based physical activity programs using the WAT program as a model and how different levels of implementation can have the most positive impact.

P171

Ability of a school-based nutrition intervention to affect physical activity: An insight into best practices for trans-disciplinary obesity interventions

Authors:

Emily Huber, John Schuna, Becky Jensen, Jessica Meendering

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Purpose:

Attributable to the amount of time children spend in a school environment, school-based interventions are an ideal and resourceful method to address health behaviors. Due to the transdisciplinary nature of childhood obesity, many programs that historically focused solely on nutrition are adding small PA components to their curriculum. Therefore, the purpose of this study was to examine the ability of a school-based nutrition focused intervention with small PA elements designed for fifth to sixth grade students to increase PA and decrease sedentary time (ST) in children.

Methods:

Physical activity and ST were assessed via accelerometer in 395 fifth and sixth grade children for seven days pre and post intervention/control. Daily minutes of ST, light physical activity (LPA), moderate physical activity (MPA), vigorous physical activity (VPA), and moderate-to-vigorous physical activity (MVPA) were calculated for all subjects using Evenson cut points 6. Changes in PA and ST were evaluated using mixed-model analysis of covariates (ANCOVAs).

Results:

One hundred seven children (intervention N=43 [8 males, 35 females] and control N=64 [29 males, 35 females]) met compliance requirements at both assessment periods. There were no significant differences between the intervention and control groups for pre to post changes in ST ($F=0.39$, $p=0.555$), LPA ($F=0.29$, $p=0.612$), MPA ($F=3.68$, $p=0.104$), VPA ($F=0.13$, $p=0.733$), or MVPA ($F=1.11$, $p=0.333$).

Conclusions:

The results of this study suggest no difference in PA and ST in nutrition intervention participants compared to control. These results indicate that a primarily nutrition focused intervention cannot indirectly affect PA patterns in child participants.

P172

Direct observations of in-school food/beverage promotions: Types, prevalence, and differences by school-level characteristics

Authors:

Lara Latimer, Keryn Pasch

Purpose:

To determine the types of food/beverage promotions, prevalence and proportions of healthy and unhealthy promotions, and variations in promotions by school-level variables (e.g., economic disadvantage, race/ethnicity).

Methods:

Photos and descriptions of in-school food/beverage promotions were documented and coded using a new electronic tool in 30 central Texas middle schools. Descriptive statistics were run to determine types and total number of promotions, and proportion of healthy and unhealthy. A chi-square goodness-of-fit test was run to determine if healthy and unhealthy promotion instances were distributed differently across all schools. T-tests were run to examine mean differences by school-level economic disadvantage and percent minority.

Results:

The most common types of ads encountered were Nutrition Education (29%) and Individual Item Promotions (25%). The most prevalent types of items were slushie/fountain punch drinks (28%) and whole fruit and/or vegetable (14%). A higher proportion of unhealthy promotions (55%), compared to healthy (45%), were found across all schools ($\chi^2(1)=23.02$, $p<0.0001$). Less economically-disadvantaged schools had a greater average number of total ads ($m=86.9$) and items ($m=7.3$), than more economically-disadvantaged schools ($m=72.5$, $m=5.9$) ($p<0.001$). Lower percent minority schools had a higher average number of total ads ($m=92.6$) and items ($m=7.1$), than higher percent minority schools ($m=60.3$, $m=5.9$) ($p<0.001$).

Conclusions:

Students' exposure to predominantly unhealthy promotions may influence their food/beverage choices. Commercial food/beverage companies may target less economically-disadvantaged schools, because these students may have higher discretionary funds to purchase products. Future studies should examine food/beverage promotions in schools in other regions of the U.S.

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The prevalence of childhood severe obesity in Texas: The Texas School Physical Activity and Nutrition (SPAN) study

Authors:

Linlin Li, Steven Kelder, Adriana Pérez, Nalini Ranjit, Deanna Hoelscher

Purpose:

Approximately 5% of children and adolescents in the U.S were classified as severe obesity (SO). However, the prevalence of childhood SO in Texas has not been reported. This study aims to describe the racial/ethnic disparities of the prevalence of childhood SO in Texas.

Methods:

The data of the Texas School Physical Activity and Nutrition (SPAN) project were used, including the information of height and weight and related lifestyle measurements of overall 50,064 4th, 8th, and 11th graders in Texas during 2000-2002, 2004-2005, and 2009-2010. We compared the prevalence of SO, defined as a BMI above 120% of the 95th percentile of gender-specific BMI-for-age or 35 kg/m² among White, Black, and Hispanic children. Multivariate logistic regression was used to examine the association between SO and race/ethnicity, controlling for time, grade and complex design features.

Results:

Overall 8.5% of Texas students were severely obese during 2000-2010. The prevalence differed by gender (boys: 10.1% v.s girls: 6.7%, $p < 0.0001$) and race/ethnicity (Hispanic: 10.8% v.s Black: 9.3% v.s White: 6.1%, $p < 0.0001$). The prevalence was the highest among Hispanic boys (13.3%) and Black girls (9.6%). Hispanic (OR=1.9; 95% CI: 1.5-2.3) and Black (OR=1.6; 95% CI: 1.2-2.1) children were more likely to be SO than white children. The prevalence of SO among Hispanic and White children have increased by 2.3% (10.0%-12.3%, $p = 0.03$) and 3.8% (4.3% -8.1%, $p = 0.02$), respectively, from 2000-2002 to 2009-2010.

Conclusions:

The prevalence of childhood SO in Texas was much higher than national average. Hispanic boys and black girls has the highest prevalence of SO.

P174

Can schoolyard improvements increase physical activity for the least active students, or just provide better opportunities for the most active?

Authors:

Lars Breum Christiansen, Mette Toftager, Jens Troelsen

Purpose:

School physical activity interventions can improve the physical environment and organizational environment of schools to increase the opportunities for physical activity (PA) in recess. The purpose of this study was to evaluate if improvements to the outdoor physical environment at the school had equal impact on all students regardless of their PA at baseline.

Methods:

The SPACE-study used a cluster randomized controlled study design with a 2-year follow-up, and enrolled 1348 students aged 11-13 years from 14 schools in Denmark. A web-based questionnaire was used to obtain knowledge of PA during recess and in leisure time. The multicomponent intervention comprised 11 components, and included a combination of changes to the physical environment and organizational changes.

Results:

At baseline, 73% of the students reported to engage in sport outside school and were characterized as “the most active”. At the intervention schools the proportion of students who reported good possibilities for outdoor PA increased (71% to 75%), while the proportion decreased at the comparison schools (87% to 68%). The proportion of students reporting to be active daily during recess decreased for all groups (87% to 58%). The decrease was smaller at the

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intervention schools (88% to 62%), but only for the students characterized as the most active at baseline (90% to 66%). Furthermore, there were large variations between intervention schools.

Conclusions:

The intervention produced considerable changes to the environment of all seven intervention schools, and had a positive impact on self-rated PA during recess for the most active students at baseline.

P175

Healthier school environment leads to decreases in childhood obesity - The Kearney Nebraska story

Authors:

Kate Heelan, Todd Bartee, Allison Nihiser, Bettylou Sherry

Purpose:

The purpose of this case study is to report the change in prevalence of overweight and obesity among elementary school students in a rural Mid-western community between 2006 and 2012. Secondly, we aimed to retrospectively evaluate the implementation of the program strategies used to decrease the prevalence of overweight and obesity by estimating the impact of each intervention strategy.

Methods:

Body weight and height has been collected annually since January 2006 as a part of yearly health screenings for all kindergarten - fifth grade students (N = 2,500 per year). Multiple strategies at multiple ecological levels were implemented to increase physical activity and healthy eating behaviors and ultimately decrease prevalence of overweight and obesity. Quality physical education, school meal programs, and BMI reporting were implemented district-wide and comprehensive physical activity programs, school food environment changes, and supportive/promotional strategies were implemented at the individual school level.

Results:

The absolute change in prevalence of obesity (BMI \geq 95th percentile) decreased from 16.4% to 13.9%, indicating a 15.2% relative change in prevalence of obesity in 6 years. There was an inverse relationship between the number of strategies implemented and prevalence of obesity over time. Presenters will report on the estimated impact of each intervention strategy on changes in obesity prevalence.

Conclusions:

Sustained reductions of obesity since 2006 in Kearney, Nebraska has been due to a variety of strategies which focus on changing the environment to more readily promote healthy eating and physical activity.

P176

Relationship between school food environment and children's dietary behaviors: Building on the Texas CORD Project

Authors:

Abiodun Oluyomi, Casey Durand, Michelle Hashemi, Elizabeth Vandewater, Steve Kelder, Nancy Butte, Deanna Hoelscher

Purpose:

There is emerging interest in understanding the mechanisms through which the built environment may affect dietary behaviors and weight status. We examined the relationships between the school environment and children's dietary behaviors.

Methods:

Our analysis was based on an ongoing community-based obesity prevention study - The Texas CORD (Childhood Obesity Research Demonstration) project. Texas CORD targets 2-12 year old children from low-income, high-minority population census tracts within Austin and Houston, Texas, USA. A total of 1804 children attending 57 schools (Pre-Ks and Elementary) were included in the current analysis. Parent-reported child's dietary behaviors were the outcomes. Geographical Information System was used to assess school environment (0.5-mile buffer) in terms of healthy versus unhealthy food outlets. Data were analyzed using bivariate and multivariable multinomial regression analysis.

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Results:

Analysis showed mixed results, where multiple favorable dietary behaviors (fruits, vegetables, 100% juice, etc.) were positively associated with both healthy food outlets and unhealthy food outlets in the school environment. However, the children exposed to healthy food outlets were much less likely to engage in unfavorable dietary behaviors (flavored drinks, soda, sugar sweetened drinks & cereals, etc.).

Conclusions:

Overall, results from the current analysis suggest that the presence of healthy food outlets may produce more significant associations with healthy dietary behaviors than the absence of unhealthy ones. The study addresses some key issues in the built environment-diet subfield, including: Exclusive focus exclusively in neighborhoods with majority low income, minority populations; and the issue of limited body of work that focuses on children.

P177

Food health & choices, obesity prevention curriculum: Classroom teacher engagement related to student reception when trained instructors facilitated lessons

Authors:

Marissa Burgermaster, Heewon Lee, Pamela Koch, Isobel Contento

Purpose:

To identify classroom-level factors affecting student reception of a nutrition curriculum as part of the process evaluation of the cluster-randomized controlled Food Health & Choices (FHC) efficacy trial.

Methods:

FHC is a theory-based nutrition curriculum that was implemented, as part of the science curriculum, in 30 NYC 5th grade classes during the 2012-2013 school year by trained, master's degree-level instructors. After each lesson, FHC instructors recorded process data on a previously validated Lesson Feedback Form (n=611). Descriptive statistics were calculated for lesson fidelity, lesson completion, student participation, student behavior, classroom teacher attitude, and classroom teacher participation. Index scores were calculated for teacher engagement (classroom teacher attitude + classroom teacher participation) and student reception (student participation + student behavior). 2-tailed Spearman's rho was used to assess correlations among variables.

Results:

Mean lesson completion and lesson fidelity (i.e., dose delivered) were both 95% and were significantly correlated ($r=.679$, $p<.01$). Mean student participation and student behavior (i.e., dose received) were 2.8/3 and 2.5/3, respectively, and were significantly correlated ($r=.429$, $p<.01$). Mean teacher attitude and teacher participation were 2.6/3 and 2.0/3, respectively, and were significantly correlated ($r=.561$, $p<.01$). The student reception index was significantly correlated with the teacher engagement index ($r=.208$, $p<.01$), lesson fidelity ($r=.160$, $p<.01$), and lesson completion ($r=.134$, $p<.01$).

Conclusions:

Despite high dose delivered with trained FHC instructors teaching the curriculum, there is evidence that classroom teachers still play an important role in students' reception of the intervention as measured by how a classroom of students participates and behaves during lessons.

P178

Preliminary results of the Texas! Grow! Eat! Go! intervention study on children's weight-related behaviors and weight status: Cohort 1

Authors:

Judith Warren, Alexandra Evans, Nalini Ranjit, Ashley Wilson, Michael Lopez, Caren Walton, Brittany Rico, Alex McIntosh

Purpose:

The Texas! Grow! Eat! Go! (TGEG) intervention study is a 5-year randomized controlled trial with 4 treatment groups with the aim of decreasing childhood obesity among 3rd grade students. This presentation will share preliminary results

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from Cohort 1 assessing the effects of 3 school-based interventions: CATCH(environmental strategy), Learn! Grow! Eat! Go! (school-garden and nutrition program) and Walk Across Texas (family-focused physical activity program) on children's diet, physical activity behaviors and body mass index (BMI).

Methods:

Interventions were implemented for 1 year in 3rd grade classrooms at 16 low-income schools serving low income and ethnically diverse children (n= 734; 46% Hispanic; 19% African American). Pre-post-test data were collected from children. Child measures developed specifically for this study population included behavioral outcomes (diet, physical activity, and gardening), related psychosocial variables, knowledge, and demographic data. Child height and weight data (to calculate BMI) were collected. Implementation fidelity was measured through teacher surveys, administrator interviews, and project specialist observations.

Results:

Preliminary results indicated increased vegetable exposure and preference, decreased screen time and increased moderate to vigorous physical activity across multiple interventions. Modest changes in the percent of children overweight and/or obese were reported for most interventions (using CDC growth charts, which account for gender and age). Implementation data showed high variation across sites and within treatments. Organizational influences were identified which contributed to implementation variation.

Conclusions:

Garden, nutrition and physical activity programs may contribute to stabilizing and reducing obesity in children. Assessing school-based intervention fidelity may contribute to understanding factors affecting child obesity.

P179

Evaluation of the STAR rope skipping intervention in Hong Kong schoolchildren and adolescents

Authors:

Amy S Ha, Angus Burnett, Raymond Sum, Nikola Medic, Johan Y Y Ng

Purpose:

Physical activity (PA) levels of children and adolescents are on a declining trend. To counteract this trend through school-based interventions, we designed a 4-week STAR (School-based intervention; Train-the-trainer; Accessibility of resources; Recreational PA) skipping program based on the ecological model of health behavior. The effectiveness of the intervention was examined in the study.

Methods:

A randomized controlled trial was conducted to evaluate the STAR program. 1,386 schoolchildren from 20 primary and secondary schools of low-to-mid socioeconomic status in Hong Kong participated in the study. Participants' schools were randomized into either the experimental or wait-list control group. Participants self-reported their health-related quality of life (HRQoL) using the KIDSCREEN-27 questionnaire. Accelerometers were used to measure the percentage of time a subgroup of participants (n = 486) spent in moderate-to-vigorous PA (MVPA) during school hours on five consecutive days. HRQoL and MVPA were measured at pretest and posttest. Hypotheses were tested using ANCOVAs.

Results:

At posttest, students' self-reported HRQoL differed slightly, with those in the experimental group, compared to the control group, reporting higher levels of autonomy and parent relationships. Unexpectedly, students in the experimental group engaged in less MVPA during school hours.

Conclusions:

Although the intervention did not increase students' PA, it improved their HRQoL, which is an important indicator of mental health. More research is needed to explore why the intervention was unable to increase participants' PA. Future studies should also explore personal or interpersonal factors that might mediate the effect of the intervention.

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P180

Using formative research to develop Commando Joe's military-style physical activity-based intervention programme: A school based intervention to improve children's health, well-being, behavior and academic achievement

Authors:

Helen Mills, Gareth Stratton, Kelly Mackintosh

Purpose:

Low childhood physical activity levels are a major public health concern, as are poor academic achievement and behavior for education. Combined physical activity and education interventions have been conducted with varied success. Commando Joe's is a unique military-style physical activity-based intervention. The purpose of this formative study was to ascertain children's and teachers views on Commando Joe's intervention, in order to tailor the intervention.

Methods:

Semi-structured group interviews were conducted in 4 primary schools, stratified by socio-economic status, with 35 children aged 9-10 years (21 boys, 14 girls) and 9 teachers (2 male, 7 female). Interview questions were structured around the PRECEDE stage of the PRECEDE-PROCEDE model and addressed views on the effectiveness of Commando Joe's intervention. All data were transcribed verbatim. Pen profiles were constructed and represented as analysis outcomes via a diagram of key emergent themes.

Results:

Views elicited by children and teachers were generally consistent. Children found the intervention fun. For teachers, instructors were positive role models, and encouraged children. Skills and values developed were fitness, teamwork, problem solving, listening, communication, independence, respect, and discipline. These transferred in to the classroom for learning. Children's outcomes were social and emotional developments and more confidence.

Conclusions:

Emerging themes provide promise that Commando Joe's military-style physical activity-based intervention could positively impact children's health, well-being and education. Future interventions should provide varied activity sessions and instructors should be positive role models, and encourage children. These results will inform the implementation of future Commando Joe's interventions.

P181

A gender specific qualitative exploration of environmental barriers to children's recess physical activity

Authors:

Charlotte Skau Pawlowski, Tine Tjørnhøj-Thomsen, Jasper Schipperijn, Jens Troelsen

Purpose:

Many children, in particular girls, do not reach the recommended daily amount of physical activity. School recess provides an opportunity for both boys and girls to be physically active, but barriers to recess physical activity are not well understood. This study explores gender differences in children's perceptions of environmental barriers to recess physical activity, using a socio-ecological framework.

Methods:

Observations and focus group interviews with 4th grade children including go-along, a post-it note activity and a ranking activity were collected during one-day visits at 17 schools. A total of 111 children (53 boys), with a mean age of 10.4 years participated and a total of 460 minutes of recess were observed.

Results:

The most significant barriers identified both by boys and girls were weather, conflicts, lack of space, lack of facilities and a new-found barrier, use of electronic devices. Despite boys and girls pointing out the same environmental barriers we found both inter- and intra-gender similarities and differences in the children's perceptions of the barriers which is important to be aware of.

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Conclusions:

The multifaceted nature of the barriers for recess physical activity seems to warrant multicomponent interventions that include social, organizational, physical and natural environmental components.

P182

Determinants of children's physical activity during physically-active academic lessons

Authors:

Vanessa Errisuriz, John Bartholomew

Purpose:

To examine relationships between teacher feedback during physically-active academic lessons and student physical activity (PA) and the impact of teacher attitude, outcome expectations, and perceived behavioral control (PBC) on feedback and student PA.

Methods:

Participants were 30 fourth-grade teachers in the intervention condition of the Initiatives for Children's Activity and Nutrition (I-CAN!) program. Observations of I-CAN! physically-active lessons assessed several types of feedback (e.g. technical instruction, content instruction, classroom management), how often and how many students were active, PA intensity, and student enjoyment. Teachers self-reported attitudes (Cronbach's $\alpha=.92$), outcome expectations (Cronbach's $\alpha=.81$), and PBC (Cronbach's $\alpha=.87$) regarding implementation of I-CAN! lessons. Items for each construct were summed then dichotomized to create high and low categories. Spearman correlations examined relationships between feedback and student PA. Mann-Whitney U tests examined impact of teacher-level predictors on feedback and student PA.

Results:

Technical instruction was positively correlated with amount, intensity, and enjoyment of student PA. Teachers with high outcome expectations provided more technical instruction ($U=164.00$, $p=.005$). Students whose teachers had positive attitudes ($U=172.00$, $p=.005$), outcome expectations ($U=164.00$, $p=.027$), and PBC ($U=170.50$, $p=.012$) had greater amounts of PA. PA intensity was greater for students whose teachers had higher attitudes ($U=155.50$, $p=.042$) and PBC ($U=158.50$, $p=.05$). Lesson enjoyment was higher for students whose teachers had positive attitudes ($U=152.5$, $p=.046$).

Conclusions:

Ensuring physically-active academic lessons are implemented with high quality is imperative for success. Of particular importance during teacher trainings is emphasizing administration of technical instruction, and impacting teacher attitudes, outcome expectancies and PBC.

P183

Physical activity levels during Swiss elementary school physical education

Authors:

Julien Chanal, Virginie Nicaise

Purpose:

The purpose of the study was to evaluate the amount of physical activity level displayed by young children in physical education classes.

Methods:

Longitudinal study at Geneva district (four waves of measurement during two years), with 855 students (aged 9-12 years) equipped with GT3X accelerometers during physical education lessons taught by PE specialists. The number of counts, steps, and their percentage of time spent sedentary and in light and moderate-to-vigorous intensity of PA were measured during the lesson.

Results:

Results for the first measurement time show that students adopt sedentary behavior 24.4% of the time, and they spend

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respectively 21.1%, 7.8%, and 46.6% of the time in light, moderate, and vigorous intensity PA. Boys participated more actively during PE classes compared to girls controlling for body mass index (BMI) and lesson length. Surprisingly, students participated in more intense PA during gymnastic activities compared to collective or individual activities (i.e., total counts per min and vigorous intensity PA). Finally, grade effect partially confirmed previous research, with an increase in student PA peaking in the 6th grade followed by a slight decrease in more advanced classes. Results and comparison with other waves of measurement will be proposed.

Conclusions:

PE classes in Geneva taught by PE specialists may contribute significantly to youths' daily activity.

P184

Clustered randomized controlled trial of a skipping intervention aimed to increase Hong Kong students' physical activity levels during school physical education

Authors:

Johan Y Y Ng, Amy S Ha, Chris Lonsdale, David Lubans

Purpose:

Schools physical education (PE) is an important venue to promote physical activity (PA) in adolescents. However, students are not sufficiently physically active during PE. Therefore, an intervention using rope skipping was designed and evaluated. Rope skipping was chosen because this activity is (1) of moderate-to-high intensity; (2) inexpensive; and (3) feasible in typical school environments in Hong Kong, where PE classes are large in size (up to 40 students) and space available for physical activity is limited (e.g., one basketball court).

Methods:

A clustered randomized controlled trial was conducted. 168 students from 24 classes participated; classes were randomized into the experimental group or wait-list control group. Students' proportion of time spent in moderate-to-vigorous PA (MVPA) was measured during four PE lessons at baseline, and four lessons at follow-up. Students in the experimental group received the intervention during follow-up lessons. Specifically, a 15-minute rope skipping was inserted in PE classes by teachers.

Results:

Multilevel modeling was used to analyze the data. Results showed that students in intervention group, compared to the control group, spent more time in MVPA (beta = .15, $p = .016$). Boys were also more physically active than girls (beta = .30, $p < .001$).

Conclusions:

The intervention was successful in increasing students' MVPA during school PE. However, the effect size was smaller than expected. Further studies are required to explore how to increase the effectiveness of the intervention.

P185

The impact of a kitchen garden project on children's relationship with food: A quantitative study

Authors:

Hannah Ensaff, Ruth Crawford, Jean Russell, Margo Barker

Purpose:

This intervention study examined a school based kitchen garden project, in a large inner city London school. Children's relationship with food, including food enjoyment, experience and food neophobia were considered.

Methods:

Pupils (age 7-11 years) completed questionnaires at the intervention school (baseline N= 154; follow up N= 164) and at a matched control school (baseline N= 171; follow up N= 174). Statistical testing, including repeated measures ANOVA, was conducted to assess the impact of the intervention on responses.

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Results:

Pupils in the intervention group (Years 3 & 4; age 7-9 years) scored significantly higher ($M=3.90$, $SD = 1.81$) for the score related to Kitchen Equipment, compared to the control school ($M=3.06$, $SD = 2.12$), $t(179)= 2.88$, $p = .004$; and scored significantly higher ($M=9.34$, $SD = 3.79$) for the overall Cooking Experience Score compared to the control school ($M=7.98$, $SD = 4.57$), $t(179)= 2.17$, $p = .03$. Repeated measures ANOVA, conducted for matched pairs, revealed a significant increase in the score related to taste description, $F(1,226) = 8.67$, $p = .004$, $\eta^2 = .037$. There was also a substantial main effect for the intervention on pupils' liking of cooking, $F(1,239) = 8.67$, $p = .004$, $\eta^2 = .035$, as well as on pupils' helping with cooking at home, $F(1,242) = 4.551$, $p = .034$, $\eta^2 = .018$.

Conclusions:

The intervention had a substantial main effect on pupils' liking of cooking, helping with cooking and taste description. There was also good evidence of the intervention's effect on pupils' food neophobia.

P186

Do after-school sports reach children at risk for an inactive lifestyle? A cross-sectional study

Authors:

An De Meester, Nathalie Aelterman, Greet Cardon, Ilse De Bourdeaudhuij, Leen Haerens

Purpose:

The purposes of this study were to examine to which degree pupils not engaging in community sports do participate in after-school sports and to assess whether after-school sports participants are more physically active in daily life than their non-participating peers.

Methods:

One thousand forty-nine children (53.7% boys; M age=11.02 years, $SD=0.02$) out of 60 classes from 30 Flemish elementary schools, with an after-school sports offer, completed a validated questionnaire to assess physical activity (Flemish Physical Activity Questionnaire). Multilevel analyses were conducted with SPSS 19.0 and MLwiN 2.26.

Results:

More than three quarters of the children (76.00%) reported to participate in after-school sports during the current school year. Almost one fifth of the total sample (17.64%) reported not to participate in community sports but nevertheless in after-school sports, whereas 9.53% reported to participate in neither one. A remarkable 64.91% of the children not participating in community sports, stated thus to participate in after-school sports. After-school sports participants were significantly more physically active than non-participants ($B=157.62$, $p<0.001$), even after controlling for their participation in physical activity more generally.

Conclusions:

When after-school sports are offered at school, the vast majority of elementary school children participates. Although after-school sports attract many children already engaging in community sports, they also reach almost two third of the children who do not yet participate in community sports. As children participating in after-school sports are more physically active than their counterparts, after-school sports participation can be considered to contribute to an active lifestyle.

P187

The effects of elementary schoolyard renovations and a physical activity recess intervention on physical activity social support, self-efficacy and enjoyment

Authors:

Katie Amato, Md Mahabub-Ul Anwar, Guangxiang Zhang, Eve Kutchman, Christine A Schaefer, Raymond Browning, Lois Brink, Claudio Nigg

Purpose:

This study investigates the effects of Learning Landscapes (LL) schoolyard renovations and SPARK Active Recreation (SPARK AR) recess curriculum on PA social-cognitive theory (SCT) mediators.

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Methods:

The IPLAY study is a randomized matched controlled trial utilizing a 2 (LL v. non-LL) X 2 (SPARK AR v. no curriculum) design. 4th-5th graders at 8 schools in Denver, CO completed self-reported self-efficacy (6 items), enjoyment (5 items), and social support (8 items) scales at baseline, and after intervention year 1 and year 2. Two-way ANOVAs determined differences in average SCT mediators over time.

Results:

There were no significant time or treatment effects for PA enjoyment (baseline= 4.346 ± 0.697) and social support (baseline= 6.22 ± 1.541), $p > 0.05$. There was a self-efficacy treatment main effect, $F(3,1355) = 3.855$, $p = 0.009$, and time main effect, $F(3,1355) = 3.855$, $p = 0.001$, which reflected a U-shaped pattern. A Tukey post hoc showed that self-efficacy was higher at renovated schoolyards than at control schools ($p = .013$). Post hocs also showed that Year 1 self-efficacy, $3.78 \pm 0.82 >$ baseline self-efficacy, 3.28 ± 0.80 , $p = 0.001$ and $>$ Year 2 self-efficacy, 3.33 ± 0.81 , $p = 0.016$.

Conclusions:

Overall, the intervention did not significantly influence SCT mediators. Neither the presence of a modified schoolyard environment nor a PA curriculum during recess was sufficient to increase SCT factors. This is consistent with cross-sectional and longitudinal main outcome analyses from this project, which showed no intervention effects on PA. Only focusing on recess may not be enough to bring about SCT changes. Future interventions should strategically target these mediators when developing intervention activities. Supported by NICHD/NCI/NIDDK R01HD057229, NIMHD U54MD007584 and G12MD007601

P188

Evaluating the impact of a commercial kitchen on students' dietary behaviors in a central Texas elementary school using mixed-methods

Authors:

Alexandra Evans, Sherman Chow, Nalini Ranjit, Andrew Springer, Shelton Brown III

Purpose:

The purpose of this study was to examine the impact of an environmental strategy (the implementation of new commercial kitchen at an elementary school) on students' dietary behaviors, satisfaction with school lunch, perceived social support to eating healthfully at school, and parent satisfaction with school lunch and school in an elementary school serving low-income, ethnically-diverse children.

Methods:

A pre-posttest control group research design was utilized. Data were collected from students at the intervention and control schools before implementation of the new kitchen (Spring 2012), 3 and 9 months after implementation (Fall and Spring 2013). Chi square and ANOVA analyses were used to compare data from the two schools. Additionally, a focus group was conducted with 5th graders at the intervention school to elicit their opinions and experiences regarding their new commercial kitchen. The focus group was audio-recorded, transcribed, and analyzed for emerging themes.

Results:

Participants included mostly Hispanic children eligible for the free and reduced national school lunch program. Results indicate a significant increase in the consumption of healthful foods ($p < .05$), student satisfaction with school lunch ($p < .05$), parent satisfaction with their child's school lunch ($p < .05$), parent satisfaction with school ($p < .05$), student perceived social support at school ($p < .05$). Focus group results indicated themes on students' preference for healthier foods; increased healthy eating knowledge; and parent satisfaction.

Conclusions:

Findings suggest that placing commercial kitchens at schools which allows for scratch cooking can have a beneficial effect on students' consumption of healthier school lunches.

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Facilitators and barriers to active recess in Chicago public schools

Authors:

Anita Bontu, Sandy Slater

Purpose:

To identify facilitators and barriers to active recess in Chicago Public Schools in response to a newly-implemented, mandatory 20-minute daily recess policy.

Methods:

Data collection at schools (N=25) included observation of 1,667 first and 1,473 fifth grade students during fall, winter, and spring recess periods using the SOPLAY and SOCARP direct observation tools. School environment audits were also completed.

Results:

Initial preliminary analyses of observational data suggest that the most common barrier to active recess was inadequate facilities, which included lack of outdoor playground structures (n=2) and small or improper indoor recess spaces (n=19) (e.g. classroom). In many schools (n=21), recess was either shortened or canceled due to inclement weather or unavailable facilities. Furthermore, when recess was held indoors, moderate to vigorous physical activity (MVPA) was reduced due to insufficient space and supervision. Conversely, experience in providing recess was a considerable facilitator to active recess which was noted in the time it took classes to transition to and from recess. Half the sample (n=13) were providing recess for the first time ever to students, as mandated by the new policy. Additionally, adequate supervision and available equipment (e.g., balls, jump ropes, etc.) contributed to higher levels of MVPA.

Conclusions:

Preliminary results show that several factors, such as facilities, supervision, and equipment can be addressed and remedied to increase levels of MVPA during recess for elementary-aged youth. Interventions based on these results can aid in successful implementation of the new recess policy.

P190

The influence of a kinderkinetika intervention programme on the scholastic performance of 6-8 year old children

Authors:

Chantell Gouws, Glynis Longhurst

Purpose:

The effect of movement on academic performance is often underrated. Movement is essential to learning and can be regarded as the door to learning. Researchers argue about the importance of movement because there seems to be a positive interchange between the brain and the body. This study reports on the influence of a kinderkinetika intervention programme on the scholastic performance of 6-8 year old children. Children were selected from schools in the Northern Zululand area of KwaZulu Natal. Two groups of children were used in this study (an experimental and control group) went through a pre-test and post-test using three test batteries. The experimental group was subjected to an eight week kinderkinetic movement programme. The results indicate that the children in the experimental group showed an improvement in scholastic performance compared to the children in the control group. There was a significant correlation ($r=.36$, $p \leq 0.05$) between motor proficiency scores and the scholastic performance of subjects in the experimental group. There was a meaningful relationship ($r=0.55$, $p \leq 0.05$) between motor proficiency scores and the scores obtained on the Conner Classroom Behavior Questionnaire. There was a significant relationship ($r=0.49$, $p \leq 0.05$) for the control group and a negative correlation of ($r 0.49$ $p \leq 0.10$) for the experimental group. Three of the four hypotheses were accepted.

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What do students gain from the timed mile run component of the FITNESSGRAM?

Authors:

Margaret Schneider, Pamela Penn, Priel Schmalbach

Purpose:

The Mile Run/Walk test (MRW) is commonly used to assess students' cardiovascular fitness as a component of the FITNESSGRAM. The formula to convert MRW times into predicted VO₂max incorporates Body Mass Index (BMI). This study examines whether the MRW is an appropriate tool to employ among overweight youth, given that elevated health risk is already evident by BMI alone.

Methods:

Students in a school-based physical activity study (N = 59; mean age = 11.05 +/- .34 years; 50% Hispanic; 50% Male) completed a MRW and a standardized test of cardiovascular fitness, and wore an Actigraph activity monitor for one week to assess moderate-to-vigorous activity (MVPA).

Results:

The correlation between predicted VO₂max (based on MRW and BMI) and measured VO₂max (from the graded exercise test) was strong ($r = .78$, $p < .001$), but weaker than the correlation between BMI and measured VO₂max ($r = .87$, $p < .001$). All students identified by the FITNESSGRAM as being in the "needs improvement" zone were at or above the 85th percentile for BMI. MVPA was associated with measured VO₂max ($r = .33$, $p < .01$), but not with predicted VO₂max.

Conclusions:

The students in this study could have been identified as being at elevated health risk on the basis of BMI, without a need for subjecting them to the MRW. Students find this test aversive, and overweight children in particular may be stigmatized owing to their longer completion times. The MRW may be unnecessary, and could be psychologically damaging to overweight students.

P192

Measuring the implementation of a school-based multi-strategy obesity prevention program

Authors:

Todd Bartee, Kate Heelan

Purpose:

The purpose of this study was to measure the estimated dose (impact) of several intervention strategies implemented to decrease the absolute change in prevalence of obesity amongst elementary students from 16.4% to 13.9% when actual effect sizes for behavior change were unknown. According to the Center for Community Health and Evaluation (CCHE) measuring dose provides a way of comparing diverse intervention strategies using a common yardstick.

Methods:

This was a retrospective evaluation case study of an elementary school district enrolling approximately 2500 students each year in grades kindergarten through fifth. Data reflect implementation of recommended strategies from 2006 to 2012. Reach, strength, and dose were calculated for each school as proposed by CCHE.

Results:

Strength scores ranged from 1% to 29%. The reach of several strategies was 100% due to implementation of environmental and policy change strategies. The highest dose score, 0.29, was for school food environment strategies suggesting that for all students enrolled there was a 29% change in nutrition-related behaviors. Comprehensive physical activity in schools strategies changed physical activity behavior by an estimated 22% amongst enrolled elementary students district-wide.

Conclusions:

This measurement approach for estimated impact may have more practical utility for decision makers whether initiated in research or practice settings. An additional benefit of this measurement approach is that it takes into consideration

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those students who do not change behavior at all due to no exposure. These findings further the discussion related to measurement of implementation for comprehensive nutrition and physical activity behavior change interventions.

P193

Physical activity during recess among 13-14 year old Mexican girls

Authors:

Catalina Medina, Ian Janssen, Peter Katzmarzyk, Simón Barquera

Purpose:

To describe the physical activity patterns during school recess and to examine the relationship between three physical activity instruments in a sample of 13-14 year old Mexican girls.

Methods:

This is a cross-sectional study that included seventy-two female adolescents from a private school in Mexico City. Three different instruments were used to monitor physical activity patterns during the recess break including an accelerometer, direct observation (SOFIT instrument), and a physical activity recall. Descriptive analyses were used to characterize physical activity patterns, and one-way ANOVA was used to examine differences across physical activity instruments.

Results:

The mean BMI was 21.4 (SD \pm 3.7), 25% of the participants were overweight, and 2.8% were obese. The average recess time was 31 \pm 2:13 minutes. Based on the accelerometer data, more than 90% of the time spent during recess was allocated to light or sedentary activities. Based on SOFIT and physical activity recall, the two most frequent activities were standing and walking. There was a significant difference ($p < 0.05$) between the three instruments for all physical activity intensities.

Conclusions:

The large amount of time spent in sedentary behavior during recess indicates the necessity to intervene upon this opportunity for adolescents to engage in physical activity.

P194

Effects of participatory physical activity program on body mass index (BMI), resting metabolic rate (RMR) and physical fitness in Thai early adolescence

Authors:

Kasem Nakornkhet, Pilin Jaree, Atchara Purakom

Purpose:

The increase in physical inactivity is thought to be one of the main risk factors for the development of non-communicable diseases, particularly, obesity in children and adolescence. Physical activity programs have been proven to assist in influencing the modifiable risk factors. This study was aim to investigate the effect of participation physical activity program on body mass index (BMI), resting metabolic rate (RMR) and physical fitness in Thai early adolescence.

Methods:

Quasi-experimental study with 4 interventions were conducted. The volunteer participates were 32 with physical inactivity and overweight (BMI : 23-24.9) elementary students in municipal school, Tak Province, Thailand. The study used pre-post test design. The students and teachers together tailoring the physical activities intervention program at 5 days per week for a period of 40-60 minute per session within 6 month. The intervention consisted of moderate to vigorous activities based on school facilities at lunch break and after school time. BMI, RMR and physical fitness were assessed and analyzed by descriptive and inferential statistics.

Results:

After 6 months of participating the intervention program, BMI of the participants were not different between groups at baseline. RMR and physical fitness level of posttest group were significantly increased from the baseline group ($p < .05$).

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Conclusions:

The participatory physical activity intervention program conducted with moderate to vigorous activities can affect the RMR and physical fitness of overweight adolescence. However, overweight and obesity prevention needs further attention. This work was supported by Thai Health Promotion foundation.

P195

Overview of Institute Of Medicine 2013 report: “Educating the student body: Taking physical activity and physical education to school”

Author:

Philip Nader

Purpose:

Less than half of youth meet the Physical Activity Guidelines for Americans recommendation of at least 60 minutes of daily vigorous to moderate-intensity physical activity, resulting in adverse impacts on student’s physical, mental and psychosocial health. The IOM was asked to examine the status of physical activity and physical education, how physical activity and fitness affect health outcomes, and to suggest recommendations.

Methods:

A multidisciplinary Committee on Physical Activity and Physical Education reviewed the scientific evidence using standardized IOM procedures and protocols, and prepared a consensus report that objectively reviewed the scientific evidence leading to six specific recommendations for action.

Results:

The detailed evidence in the report comes from the fields of education, kinesiology, physical education, nutrition, pediatrics, child development, neurosciences and brain health, psychology and cognitive development, public health and health policy research. The six recommendations are: (1) a whole school approach that provides access in the school environment to at least 60 minutes per day of vigorous to moderate physical activity; (2) Considering physical activity in all school-related policy decisions; (3) Designation of physical education as a core subject; (4) Monitoring physical education and opportunities for physical activity in school; (5) Providing pre-service training and professional development for teachers; and (6) Ensuring equity in access to physical activity and physical education.

Conclusions:

Existing and emerging scientific evidence supports an effort to promote the school environment as a relevant societal force to improve the health of the population as well as optimizing learning and achievement.

P196

Volume and pattern and seasonal variation of school-day sedentary time: A cross-sectional study in Swedish 2nd and 5th graders

Authors:

Andreas Fröberg, Peter Pagels, Cecilia Boldemann, Anders Raustorp

Purpose:

Some evidence suggests an association between sedentary behavior and increased cardio-metabolic disease risk. The purposes of this study are to describe volume and pattern of school-day sedentary time, and compare school-day sedentary time across seasons in terms of volume and pattern in Swedish 2nd and 5th graders.

Methods:

Volume and pattern of sedentary time (<100 counts per minute) were objectively measured with accelerometer (Actigraph GT3X+) in 75 (boys n=40) 2nd and 88 (boys n=43) 5th graders in three different schools in September 2012 and March and May 2013 (Kidscape II project). The pupils were encouraged to wear the accelerometer at the right hip by means of an elastic band for the whole school-day except during water-based activities. Pupils with three or more school days per week of accelerometer-data will be considered for further analysis. Daily mean and median of volume

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(total minutes spent sedentary) and number of bouts (prolonged sequences of sedentary time lasting ≥ 20 , ≥ 10 and ≥ 5 consecutive minutes) and breaks of sedentary time are calculated for September, March and May respectively. The one-way repeated measures analysis of variance (rANOVA) will be used when comparing seasonal variations of volume of sedentary time and number of bouts and breaks of sedentary time.

Results:

We hypothesize that volume and pattern of sedentary time differ between age, gender and seasons. Preliminary results will be presented during the conference.

Conclusions:

This study will provide insight in volume and pattern and seasonal variations of school-day sedentary time in Swedish 2nd and 5th graders.

P197

School cafeteria noise: A predictor of food waste?

Author:

Carmen Byker

Purpose:

Limited research has been conducted to test noise on dietary intake among young children, despite a documented relationship between noise and youth's cognitive performance within a classroom setting. This research studied to what degree does school cafeteria noise food consumption and food waste of young children.

Methods:

Phase I involved assessing sound/noise levels and mediators within four elementary schools for one day with comparable levels of eligibility for free and reduced school lunch. The schools with the highest and lowest level of noise were selected to enter into Phase II, when sound/noise levels and mediators and food consumption and waste among one pre-kindergarten and three kindergarten classes will be measured for five consecutive days.

Results:

Food waste observations were made for 304 meals with one pre-kindergarten class and four kindergarten classes in one school during one week. The research team collected school lunch trays and meal components were separated into bins relative to each food or beverage appearing on the school's daily menu. Bins were weighed in grams and converted to ounces at the end of each lunch period. Of 5,060 ounces of food and beverages served, 2,319 ounces (45.8%) were wasted during one full school week. School noise may be a contributor to varying levels of waste within food groups.

Conclusions:

Study findings may guide novel and innovative, generalizable, low-cost approaches for school cafeterias to increase healthy food consumption and reduce food waste beyond changes to the NSLP menu.

P198

Effects of physically active lessons on academic achievement in elementary school children: Physical activity across the curriculum (PAAC)

Author:

Josephy Donnelly

Purpose:

Determine the effects of active lessons on academic achievement in elementary school children.

Methods:

Three year, cluster randomized controlled trial in 22 elementary schools. Elementary school teachers were trained to deliver 90 minutes/wk of their existing lessons using moderately-vigorous physical activity. Outcomes were the com-

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parison between intervention and control for BMI, waist circumference, blood pressure, blood chemistry, daily physical activity, fitness, and academic achievement.

Results:

The three-year change in Body Mass Index for PAAC was 2.0 ± 1.9 and control 1.9 ± 1.9 , respectively (NS). However, change in Body Mass Index from baseline to 3 years was significantly influenced by exposure to PAAC. Schools with ≥ 75 min of PAAC/wk showed significantly less increase in Body Mass Index at 3 years compared to schools that had < 75 min of PAAC (1.8 ± 1.8 vs. 2.4 ± 2.0 , $p=0.02$). PAAC schools had significantly greater changes in daily physical activity and academic achievement scores.

Conclusions:

The PAAC approach may promote daily physical activity and academic achievement in elementary school children. Additionally, 75 min of PAAC activities may attenuate increases in Body Mass Index.

P199

A qualitative study of a primary school kitchen garden project: Pupils as agents of change

Authors:

Hannah Ensaff, Charmaine Canavon, Ruth Crawford, Margo Barker

Purpose:

This study sought to examine the impact of a school based kitchen garden project on pupils at a large inner city London school.

Methods:

Pupils in Years 3 and 4 (age 7 - 9 years) participated in kitchen classroom sessions (90 minutes every fortnight). Focus group discussions (with 76 pupils, 16 parents) and interviews (with Head Teachers, catering managers and specialist staff) were conducted at the intervention school and a matched control school. Categories and concepts were derived using a grounded theory approach.

Results:

Data analysis provided three main categories each with related concepts: Pupil factors (enthusiasm and enjoyment of cooking, trying new foods, food knowledge and awareness, producing something tangible); school factors (learning and curriculum links, resource implications and external pressures) and home factors (take home effects, confidence in cooking and self esteem, parents' difficulties cooking at home with children). The grounded theory that emerged centres on the take home effects beyond the school gate. In particular, participation in the kitchen classroom sessions elevates children's enthusiasm and enjoyment of cooking. Further, pupils influence cooking and food choice at home, and act as agents of change. Both this engagement and the opportunity to cook support children's developing food awareness, skills and food confidence.

Conclusions:

In the grounded theory that emerged, take home effects dominate. In particular, children's active role within a family and the impact that they can have on food choices and practice within the home are highlighted.

P200

School gardens in elementary schools: Increased prevalence and demographic disparities

Authors:

Anna Sandoval, Lindsey Turner, Frank Chaloupka

Purpose:

The current study examined the prevalence of school garden programs (in which students participate in growing fruits and/or vegetables) at US public elementary schools, trends over time, and demographic and regional disparities in prevalence.

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Methods:

As part of the Bridging the Gap research project, annual surveys (mailback and online data collection) were gathered from administrators at nationally-representative samples of public elementary schools between the 2006-07 and 2011-12 school years (N each year from 553 to 748). Data were weighted to allow for inference to the prevalence of practices in elementary schools nationwide.

Results:

The prevalence of administrator-reported school gardens increased steadily over time, from 11.9% in 2006-07 to 21.7% in 2011-12 ($p < .001$). In a multivariate logistic regression model (controlling for complex sample design and clustering of schools within districts), several variables emerged as significant predictors of whether the school had a garden program. Compared to schools in the Northeast, school gardens were more prevalent in the West but less prevalent in the Midwest. School gardens were less prevalent at schools serving higher proportions of lower-income students (i.e., eligible for free/reduced-priced meals), and gardens were more prevalent at urban schools than at schools located in suburbs, towns, or rural areas.

Conclusions:

School gardens have increased in popularity but there is still room for wider implementation of such programs, particularly those serving lower-income students. Disparities will be further explored in the presentation.

P201

If we write it, will they play? The relationship between school physical activity (PA) policy strength and local rates of physical activity

Authors:

Erin Smith, Serena Parks, Paul Estabrooks

Purpose:

Little research has evaluated the effect of physical activity (PA) policy strength on the rates of PA within public schools. The purpose of this study is to evaluate the relationship between PA policy strength and PA rates of selected schools. We hypothesize that schools in districts with stronger PA policies will have higher rates of local PA.

Methods:

From a prior evaluation of 145 school district PA policies throughout Virginia, Maryland and DC, seven districts (3 strong policies and 4 weak policies) out of 20 recruited agreed to participate in the preliminary study. One middle school from each district was randomly selected for systematic observation. At each school, PA rates were collected and measured by two researchers during one school day using the System for Observing Play and Leisure Activity in Youth (SOPLAY).

Results:

49 PA spaces were measured at 7 middle schools, and schools with stronger PA policies trended toward having higher mean rates of PA than middle schools with weaker policies (strong- $M = 30.99 \pm 35.39$ kcal/kg/min; weak- $M = 10.61 \pm 7.4$ kcal/kg/min; $t(5) = -1.15$ $p=0.30$). Stronger policy schools also had higher mean energy expenditure rates after school than weaker schools (Strong- $M = 17.41 \pm 19.95$ kcal/kg/min; Weak- $M = 3.44 \pm 6.53$ kcal/kg/min; $t(5) = -1.3$ $p=0.23$).

Conclusions:

The preliminary data suggest that schools that adopt strong PA policies may have higher local PA rates. Given the small sample of 7 schools in this preliminary study, more research is needed to establish what impact policy quality may have on local behavior.

P202

Environmental influences of preschool children's activity levels during physical education lessons

Authors:

Bik Chow, Lobo Louie

Purpose:

The purpose of the study was to determine the environmental influences (e.g., activity area size, temperature) of children's activity levels during preschool physical education (PE) lessons.

Methods:

Children's activity data of PE lessons in four days from each preschool were collected by trained observers based on the activity codes (lying, sitting, standing, walking, vigorous) of the System for Observing Fitness Instruction Time (SOFIT, McKenzie et al., 1991).

Results:

Ninety PE lessons of children aged 3-6 years from 4 preschools were observed in summer. The means for class size, lesson length, activity area size, and temperature were 24 ± 5 , 23 ± 3 min, 118 ± 77 m², 28 ± 3 °C, respectively. The mean percent of moderate-to-vigorous physical activity (MVPA%) was $50.1 \pm 15.9\%$. There were no significant differences in MVPA% between outdoor (n=21) and indoor (n=69) lessons and between lessons held in mild and hot conditions. However, there were significant differences in four preschools ($p=0.001$) and activity area size per child ($p=0.02$) with small area per child having highest MVPA% (57.0%) compared to medium (MVPA%=45.7%) and high area per child (MVPA%=47.33%). Furthermore, result from regression analysis showed 14.5% explained variance with "activity area size per child" being a significant environmental variable.

Conclusions:

To conclude, if taking 50% PE class time attributed to MVPA as the minimum standard, then Hong Kong preschool children just meet the activity standard for PE lessons. Although the type of preschool is an influencing variable, preschool with larger activity area size does not relate to higher activity levels of preschool children during PE lessons.

P203

Role of the administrator in establishing a healthy school community

Authors:

Erica Roberts, Nicole McLeod, Kate Storey

Purpose:

School-based health promotion initiatives have shown to be effective in addressing childhood obesity by encouraging the adoption of healthy behaviors. Further confirmation, however, is needed to move towards evidence-based practice. The proposed research project explores aspects of a school-based health promotion initiative, the Alberta Project Promoting active Living and healthy Eating in schools (APPLE Schools). Previous evaluations of this project revealed that the uncontested support of the school principal was imperative for program success. Further investigation into this area is required to determine the impact of school leadership practice on the implementation and sustainability of school-based health promotion initiatives, like APPLE Schools.

Methods:

Focused ethnography was used as the guiding method in this research. Semi-structured, one-on-one interviews were conducted with APPLE School administrators (n=30). Interview transcripts were analyzed using latent content analysis.

Results:

Preliminary analysis of administrator interviews highlighted three main findings: 1) Administrators function as key and active 'supporters' in relation to the implementation of the project, regardless of whether they are acting as a project lead; 2) administrators must value the principles behind the project and actively role-model healthy behaviors; and 3) administrators must enable students and staff to take ownership of the project, implying a highly relational role.

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Conclusions:

This research contributes to the overall evaluation of APPLE Schools, while also adding to the evidence-base of school-based health promotion initiatives, helping to inform research and practice. This will allow for the creation of more effective interventions, leading to greater impact and improved health outcomes for children.

Children Physical Activity

P204

“Keep trying, it took me a while to get that too!” The effects of peer feedback on relation-inferred self-efficacy (RISE), self-efficacy, and motivation in youth physical activity

Authors:

Jeffrey Graham, Steven Bray

Purpose:

Peer influences are among the strongest social correlates of children's attitudes and behaviors at early ages. The objective of this study was to explore children's perceptions of feedback they receive from peers when participating in physical activity settings as it relates to their development of self-efficacy. We also investigated children's perceptions of relation-inferred self-efficacy (RISE) derived from peer interactions as potential sources of self-efficacy.

Methods:

Semi-structured interviews were carried out with 30 children (18 boys) aged 8-12. Participants were briefed about the conceptual nature of self-efficacy and RISE. Children then responded to a series of structured questions and provided examples as well as contextual information regarding their physical activity experiences when they received feedback from their peers that informed their self-efficacy and RISE. Interview data were transcribed and a content analysis was performed.

Results:

Transcripts yielded 542 individual meaning units that were subjected to thematic analysis. Emergent themes consisted of general encouragement, specific efficacy-building statements (e.g., You can do it, I believe in you), modeling (e.g., When they show me, I know I will be able to), and expressiveness (e.g., high-fives, cheering).

Conclusions:

Results showed that children are cognizant of self-efficacy and RISE within physical activity settings and use feedback from peers to inform these perceptions. Findings support theory regarding RISE as a relation-based perception informed via interpersonal interactions with peers that may mediate effects of verbal and experiential feedback on self-efficacy.

P205

Associations between children's screen-based behaviors and cardiovascular risk factors independent of objectively measured physical activity and diet

Authors:

Sarah Robinson, Nicola Ridgers, Robin Daly, Jo Salmon

Purpose:

To determine whether time spent in screen-based behaviors (TV viewing, computer use and playing electronic games [e-games]) is independently associated with individual and clustered cardiovascular disease (CVD) risk factors among primary school children.

Methods:

Children aged 7-10 years (n=409) were recruited from primary schools across Melbourne. Average time (mins/day) spent in screen-based behaviors was obtained by a proxy-report questionnaire. Anthropometric data were collected using standardised procedures. Systolic (SBP) and diastolic (DBP) blood pressure was measured using an automatic digital

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blood pressure machine. Lipoprotein levels were measured from fasted, morning blood samples by a commercial laboratory. Linear regression models, adjusting for school clustering, socioeconomic status (SES), physical activity, diet and waist circumference were used to assess the associations between screen-based behaviors and CVD risk factors.

Results:

After adjusting for SES, physical activity, diet and waist circumference, TV viewing was positively associated with BMI ($p=0.002$), waist circumference ($p=0.02$) and SBP ($p=0.05$). Time spent playing e-games was positively associated with low density lipoprotein levels ($p=0.05$) and total screen time was positively associated with BMI ($p=0.02$).

Conclusions:

The current study provides cross-sectional evidence of differential CVD risk associated with some screen-based behaviors that is independent of SES, physical activity, diet and adiposity. The association between screen time and cardiovascular risk factors appears to vary by the type of screen-based behavior. Clear distinction between types of screen-based behaviors is an important consideration in future public health strategies and research.

P206

Sedentary behavior & childcare settings: Identifying intervention opportunities

Authors:

Kelsie M. Full, Janette Angulo, Hena Din, Griselda Cervantes, Jamie Moody, Guadalupe X. Ayala

Purpose:

This study evaluated policies, practices, and environmental factors related to screen-time and sedentary behavior in the childcare setting to inform the design of interventions. Centers were recruited to participate in the CDC-funded Childhood Obesity Research Demonstration (CORD) study in Imperial County, California, USA.

Methods:

Baseline measures for the Our Choice study included provider interviews and environmental observations ($N=26$) conducted in Fall 2012. These measurement tools were designed to assess current policies, practices, and environmental factors related to children's nutrition and physical activity. Variables of interest for this analysis were television and computer presence, use, and policies. Analyses were stratified by childcare center type and descriptive analyses were used to examine differences.

Results:

Of the 26 childcare centers, 14 were state and 12 were private. Of the childcare centers with a television ($N=7$), 86% were private centers. No state centers reported allowing television to be viewed by children each day, while 25% of private did. Presence and use of computers presented opposite results: Of the centers with a computer ($N=6$), 83% were state centers. Within these state centers, 29% of providers reported allowing computer or video games to be played daily, and an additional 29% reported allowing weekly use.

Conclusions:

Study findings demonstrate the potential differences in screen-time type that exist between state and private childcare centers. Future research should consider childcare center type when developing interventions for screen-time and sedentary behaviors.

P207

"Let me show you how confident I am in you": Effects of a coaches' communication workshop on youth sports participants' perceptions of RISE and self-efficacy

Authors:

Steven Bray, Paul Saville, Denver Brown, Kathleen Martin Ginis, John Cairney, Andrew Pettit, Debbie Marinoff-Shupe

Purpose:

Current statistics show declining rates of sport participation among youth in Canada. Children's beliefs in their abilities are motivators of sport participation. These beliefs arise, in part, through feedback they receive and perceptions they

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develop about how others view their abilities (relation-inferred self-efficacy [RISE]). The objective of this study was to investigate the effects of a training workshop on sport coaches' use of verbal and non-verbal behaviors intended to enhance children's RISE.

Methods:

Twelve coaches and 79 youth (ages 7-12) taking part in a university-based summer sport camp participated in the study. Coaches took part in a workshop (1hr) training methods of providing RISE-relevant feedback to children. Coaches' behaviors were audio/video recorded during camp sessions prior to (1 session) and following (2 sessions) the workshop. Youth participants completed measures of RISE and self-efficacy following each of the sessions.

Results:

There were significant positive changes in coaches' use of RISE-enhancing feedback following the workshop ($p < .05$). Sport participants' RISE and self-efficacy also increased in the sessions after the workshop ($p < .05$). Mediation analyses showed increases in self-efficacy were partially attributable to changes in RISE.

Conclusions:

Results suggest changes in coaches' behaviors following the RISE workshop led to increased RISE among participants. Changes in RISE, in turn, accounted for changes in self-efficacy. Sport coaches can learn and implement strategies to effectively communicate their beliefs in their athletes' capabilities. Increasing children's RISE beliefs leads to enhanced self-beliefs about their abilities and may encourage greater motivation to participate in sports.

P208

Physical activity summer programming attenuates summer weight gain in low-income minority girls

Authors:

Lara Dugas, Amanda Ward, Kimberly Burdette, Rebecca Sifton, Amy Luke, Amy Bohnert

Purpose:

Summer programming, particularly those promoting physical activity (PA) may provide a structured environment for those more at risk of weight gain during the summer months, such as low-income youth. The aim of this study was to determine the impact of a five-week community-based summer program on adiposity and PA levels in low-income, minority girls.

Methods:

Participants were recruited from an urban camp for low-income minority girls over two summers. Of the 66 girls who were recruited, 57 (11.6 ± 1.0 yr) had complete baseline and follow-up PA data. Baseline testing was completed approximately 2 weeks prior to the start of the summer program following completion of the school year. Follow-up testing was completed during the last week of the camp, 4 weeks later. Weight and height were used to calculate BMI percentiles and PA were captured using accelerometry. Standard accelerometer cut-points and methodology were applied to capture moderate and vigorous PA (MVPA, min/d) in 1- and 10-min bouts.

Results:

BMI remained stable over the five week period. Overall girls increased their total daily PA by 151 min/day ($p < 0.001$). Moderate activity was increased by 27 min/day and the girls doubled their daily vigorous activity ($p < 0.001$). MVPA in 10-bouts increased by 23 min/d ($p < 0.001$) and the girls added almost two 10-minute MVPA bouts to their day during the week they were enrolled in camp.

Conclusions:

Our findings suggest that summer programming, particularly those promoting PA, may provide one avenue for attenuating summer weight gain, in low income minority adolescent populations.

P209

Independent associations between physical activity and sedentary time with indicators of adiposity and cardiovascular risk in youth sport participants

Authors:

Sally Fenton, Joan Duda, Timothy Barrett

Purpose:

There is currently a childhood obesity epidemic, and the relative contributions of moderate to vigorous physical activity (MVPA) and sedentary time (ST) are unclear. Youth sport is a context assumed to hold importance in terms of promoting children's MVPA engagement. The present aim was to examine simple and independent associations between daily MVPA and ST with markers of obesity and cardiovascular disease in youth sport participants.

Methods:

117 male grassroots footballers ($\text{Mage} = 11.68 \pm 1.61$) wore a GT3X accelerometer for 7 days. Participants' body mass index (BMI), percent body fat (Tanita SC3310, BF%) and waist circumference (WC) were recorded. Cardiorespiratory fitness (CRF) was assessed via the 20-meter shuttle run test.

Results:

Daily MVPA was significantly negatively associated with BMI-SDS ($\beta = -.17, p < .05$) and BF% ($\beta = -.18, p < .05$) and positively associated with CRF ($\beta = .24, p < .01$). Daily ST was positively associated with BF% ($\beta = .35, p < .01$) and WC ($\beta = .28, p < .05$) and negatively related to CRF ($\beta = -.30, p < .01$). Independent associations were not observed for MVPA and ST with health outcomes. However, relationships were stronger for ST than for MVPA.

Conclusions:

Youth sport is a setting through which PA interventions might contribute towards counteracting the childhood obesity epidemic. Results suggest reducing ST may be more important than increasing MVPA in youth sport participants when considering levels of adiposity and cardiovascular risk. However, interventions to increase MVPA are also relevant given the co-dependent associations between MVPA and ST with presently assessed health outcomes.

P210

Socioeconomic position and childhood sedentary time: Evidence from the PEACH project

Authors:

Richard Pulsford, Pippa Griew, Angie Page, Ashley Cooper, Melvyn Hillsdon

Purpose:

Studies examining socioeconomic position (SEP) and childhood sedentary time have employed a variety of measures of SEP which may have differential associations across different parts of the day. We examined associations of multiple indicators of SEP and accelerometer-measured, temporally specific, sedentary time in school children.

Methods:

Sedentary time data for weekdays before-school (7.00-8.59AM), during school-time (9.00AM-2.59PM) and after-school (3.00PM-11.00PM), and weekend days were recorded for 629 10-11 year old children using accelerometers. Ordinary least squares regression was used to examine associations with 5 indicators of SEP (area deprivation, annual household income, car ownership, parental education and access to a private garden).

Results:

Following adjustments for covariates, having a parent educated to university degree level was associated with more minutes of school (5.87 [95% CI 1.72, 10.04]) and after-school (6.04 [95% CI 0.08, 12.16]) sedentary time. Quartiles of area deprivation (most to least deprived) were positively associated with after-school (Q2: 4.30 [95% CI -6.09, 14.70]; Q3: 10.77 [95% CI 0.47, 21.06]; Q4: 12.74 [95% CI 2.65, 22.84]; Ptrend = 0.04) and weekend (Q2: 26.34 [95% CI 10.16, 42.53]; Q3: 33.28 [95% CI 16.92, 49.65]; Q4: 29.90 [95% CI 14.20, 45.60]; Ptrend = 0.002) sedentary time. Having a garden was associated with less sedentary time after-school (-14.39 [95% CI -25.14, -3.64]) and at weekends (-27.44 [95% CI -43.11, -11.78]).

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Conclusions:

Associations between SEP and children's sedentary-time varied by SEP indicator and time of day. This highlights the importance of measuring multiple indicators of SEP and examining context specific sedentary time in children.

P211

Age is just a number; maturity in movement is a choice

Authors:

Wesley O' Brien, Sarahjane Belton, Johann Issartel, Bronagh McGrane

Purpose:

In recent years, there has been a compelling argument to suggest that fundamental movement skill (FMS) proficiency is positively associated with childhood physical activity and fitness levels. Considering children have the developmental potential to master most FMS by 6 years of age, there has been a noticeable absence in the literature documenting "actual FMS age equivalence" amongst youth. This study is the first of its kind to systematically investigate 12 to 14 year olds FMS age equivalence using a globally accepted measurement tool.

Methods:

One hundred and fifty four participants (12.88 ± 0.44 yrs) were assessed during their typical 80 minute physical education (PE) lesson using the Test of Gross Motor Development-2 (TGMD-2). To ensure that adolescent performance was constant across skills over time, a 48 hour time sampling test-retest reliability measurement was undertaken. Two way ANOVA's explored the impact of gender and schools on FMS proficiency.

Results:

There was a significant gender difference in locomotor subtest score ($p < 0.0005$), with males possessing significantly higher skill proficiency. Accounting for actual age equivalence using the norm-referenced, standardized TGMD-2, results indicated that participants were performing the range of skills at a developmental capacity of $7.35 (\pm 1.1)$ years.

Conclusions:

Results of this study highlight that gender differences in locomotor skill proficiency exist. Yet, overall gross motor skill proficiency amongst Irish youth is far below their expected level of age equivalence. School based programmes with developmentally appropriate FMS experiences delivered by PE specialists can significantly improve FMS proficiency in youth.

P212

Application of machine learning to pattern recognition in children

Authors:

Melitta McNarry, Kelly Mackintosh

Purpose:

Children's physical activity levels are associated with physiological and psychological health. In order to further elucidate these relationships and the mediating influence of interventions on them, it is pivotal to accurately measure and interpret physical activity data. This has previously been hindered by cumbersome and imprecise measurement techniques, which fail to account for the broad spectrum of behaviors and movements typically observed. The objective of the present study was to apply machine learning techniques to identify specific patterns in accelerometer data that correspond to particular movements.

Methods:

Forty children aged 10.8 ± 1.0 years (mass: 38.6 ± 10.2 kg; height: 1.44 ± 0.08 m) participated in a maximal exercise test to determine peak oxygen uptake and a 30 minute active video gaming protocol whilst wearing a novel overall dynamic body acceleration miniature acceleration data-logger, sampling at 100Hz. The data-loggers were placed on nine different anatomical positions and comprised of a tri-axial accelerometer (logging range = $\pm 16g$) and a tri-axial magnetometer. In addition, participants wore 9 ActiSleep accelerometers, at the same anatomical locations, and an

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ActiHeart.

Results:

Machine learning revealed unique patterns in the data could be attributed to specific movements. Furthermore, the size of these patterns reflected the intensity of the movement, according to the oxygen uptake associated with the movement.

Conclusions:

The present results support the use of these accelerometers in a natural play environment and suggest that it may be possible to more accurately determine energy expenditure in children during habitual daily activities.

P213

Increasing girls' physical activity and reducing inactivity during an organised youth sport basketball camp: A randomised controlled trial

Authors:

Justin Guagliano, Chris Lonsdale, Gregory Kolt, Richard Rosenkranz, Emma George

Purpose:

There is a need to evaluate strategies for increasing moderate-to-vigorous physical activity (MVPA) in organised youth sport (OYS). Coach education sessions (CES) in this study were designed to increase MVPA and decrease inactivity during training. We investigated whether coaches who attended CES could increase girls' MVPA and reduce inactivity during training over a 5-day OYS basketball program compared with coaches who did not attend CES.

Methods:

A randomised controlled trial design was employed. The intervention group received coaching from coaches who attended two CES after baseline assessments versus a no-treatment control group. Participants were 76 girls, aged 9-12y (mean 10.5±1.0y), recruited from Sydney, Australia. Each girl wore an accelerometer from baseline (Day1) to follow-up (Day 5).

Results:

Linear mixed model showed the mean percentage of time spent in MVPA significantly increased (mean difference=14.6, SE=2.1, $p<0.001$), particularly vigorous physical activity (VPA; mean difference=12.6, SE=1.9, $p<0.001$), in the intervention group compared with the control group from baseline to follow-up. Compared with the control group, the mean percentage of time spent inactive was significantly reduced in the intervention group from baseline to follow-up (mean difference=14.2, SE=2.3, $p<0.001$).

Conclusions:

CES can increase the proportion of training time spent in MVPA and reduce inactivity. Substantial increases in VPA were found, which is an important finding because VPA (compared to lower-intensity activity) is associated with reduced risk of chronic diseases among youth. Since a high proportion of youth participate in OYS, CES designed to increase MVPA and reduce inactivity could have major public health implications.

P214

Socioeconomic status and participation in physical activity during childhood to adolescence: A longitudinal examination

Authors:

Matthew Kwan, Divya Joshi, John Hay, Brent Faught, John Cairney

Purpose:

The study aims to highlight the relationship between socioeconomic status (SES) and physical activity involvement during childhood and adolescence among a Canadian community sample.

Methods:

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A prospective cohort of children (N=2278; 1158 boys) were followed from ages 10 to 14, including seven repeated assessments of self-reported participation in organized and free play activities using the Participation Questionnaire (Hay, 1992). Residential postal codes were used to generate proxy household income estimates based on census information, which were subsequently stratified to the highest and lowest quartiles. Mixed effects models were used to test the effect of SES on total, organized, and free-time physical activities, controlling for gender and BMI.

Results:

The findings indicate that there was a significant main effect for time on organized activity ($B = -0.02$, $p < .01$) and free-time activity ($B = 0.02$, $p < .01$), but not total physical activity. A significant main effects also emerged for SES as it related to total physical activity ($B = 1.7 \times 10^{-5}$, $p < .01$) and organized activity ($B = 1.2 \times 10^{-5}$, $p < .01$), but was non-significant for free-time activity. All two-way interactions between time and SES were non-significant.

Conclusions:

Results from the study found participation in free-time activities increasing, and organized physical activities decreasing, during childhood and adolescence. The results also suggest that children in the higher SES participate in significantly more total and organized physical activities. The non-significant interactions, however, lends support to the persistence model, positing that the SES and physical activity relationship during childhood should remain fairly stable over time.

P215

Stress and physical activity in children with asthma: An ecological momentary assessment study

Authors:

Genevieve Dunton, Eldin Dzibur, Stephen Intille, Rob McConnell, Marilyn Li

Purpose:

Children with asthma are at greater risk of physical inactivity, obesity, and other chronic health conditions. Understanding how to promote physical activity among children with asthma has been limited by retrospective self-report methods.

Methods:

Low-income, Hispanic children (N = 20) (7th-12th grade) (54% male) with chronic asthma completed seven days of real-time Ecological Momentary Assessment (EMA) on Android smartphones with an average of three assessments per day. EMA surveys asked over the past few hours whether children had experienced perceived stress (e.g., from being teased, getting into an argument) (4 items, cronbach's $\alpha = .90$), asthma worry (e.g., worry about having an asthma attack) (3 items, cronbach's $\alpha = .64$), and asthma symptoms (e.g., wheezing) (4 items, cronbach's $\alpha = .81$). At the same time children wore an Actigraph GT2M accelerometer.

Results:

On any given day, moderate-to-vigorous physical activity (MVPA) was negatively associated with perceived stress ($r = -.495$, $p < .001$), and unrelated to asthma worry and asthma symptoms. The relationship between daily perceived stress and MVPA remained significant ($B = -.233$, $p = .025$) after controlling for sex, grade in school, and receipt of free school meals. For each 1-unit increase on the perceived stress scale, children engaged in 11.9 fewer minutes of MVPA that day.

Conclusions:

Real-time EMA methods showed that stress unrelated to asthma was more closely associated with reduced physical activity on any given day than asthma-specific stressors—indicating potential areas to intervene in order to promote physical activity in this population.

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P216

Are environmental perceptions and walkability related to health behaviors in children?

Authors:

Andreia Nogueira Pizarro, Jose Carlos Ribeiro, Jorge Mota, Maria Santos

Purpose:

To analyze associations between environmental perceptions and health behaviors between children from low (LWA) and high walkability areas (HWA).

Methods:

This cross-sectional study includes 102 children (11.6+/-0.7y) from Porto (Portugal) living in areas with high and low GIS-based walkability. Moderate to vigorous physical activity (MVPA) and sedentary time was measured with accelerometer; built environment perceptions were accessed by questionnaire. Active commuting to school (ACS) and food intake were self-reported. Statistics include Qui-square, t-test and logistic regression analyses.

Results:

No differences were found in sedentary and MVPA time between children from LWA and HWA, however children from HWA used ACS more frequently. Children from LWA were more likely to ACS if they perceived more safety (OR=2.79, IC 0.01-0.68). Perceptions of easy access to shopping, public transportation and friends' houses as well as perceptions of graffiti walls significantly differ between walkability groups. Better accessibility to shopping and public transports was found in HWA while children from LWA considered easier access to friends' houses. Participants from LWA also perceived better neighborhood aesthetics (less graffiti). Interestingly, children from HWA had significantly higher food intake than children from LWA.

Conclusions:

In HWA proximity to destinations may not be enough to improve MVPA particularly by ACS. On the other hand this easy access may contribute to high food intake (shopping food courts, fast food restaurants, candy shops). In LWA as distances are bigger, focus on increasing ACS by improving neighborhood safety can be an important health promotion strategy. Grant PEst-OE/SAU/UI0617/2011, PTDC/DES/099018/2008- FCT/FCOMP-01-0124-FEDER-009573, SFRH/BD/70513/2010.

P217

Physical activity levels across the early primary years

Authors:

Jeff R. Crane, Vivienne A. Temple, PJ Naylor

Purpose:

To examine physical activity levels in kindergarten and grade 2 in cross-sectional cohorts and a longitudinal sample.

Methods:

Ninety-six kindergarten children (Mage=5y 7m, 58% boys) from 8 British Columbia schools participated in 2010-11, and 101 grade 2 children (Mage=7y 9m, 52%, boys) participated in 2012-2013. A sub-cohort of 21 children were tracked from kindergarten to grade 2. Physical activity (PA) was assessed for 7 days in kindergarten and grade 2 using Actigraph GT1M accelerometers.

Results:

Comparing the kindergarten and grade 2 cohorts using independent t-tests, PA levels (Light PA and MVPA) were significantly lower in grade 2 and sedentary behaviour was significantly higher, specifically: Light PA = 220 and 186 min/day, MVPA = 134 and 100 min/day, and sedentary behaviour = 367 and 439 min/day. Repeated measures ANOVA revealed a similar pattern for the tracking sample. On average, children participated in 31 fewer min/day of Light PA, 42 fewer min/day of MVPA, and 68 more min/day of sedentary behaviour in grade 2. All differences were significant at $p < .001$. Tracking correlation coefficients (ICCs) over the two years were: .59, .30, and .77 for total PA, MVPA, and sedentary behaviour, respectively.

Conclusions:

Both the cross-sectional cohorts and the longitudinal cohort revealed that in grade 2 PA levels were lower by approximately 60 min/day, with a concomitant increase in sedentary behavior. A greater understanding of the determinants of this concerning trend, as well as investigation of approaches to help children maintain higher PA levels across these early primary years, are needed.

P218

A systematic literature review with meta-analysis of within - and between - day differences in objectively measured physical activity in young people

Authors:

Hannah Brooke, Kirsten Corder, Andrew Atkin, Esther van Sluijs

Purpose:

To review the literature describing within- and between-day differences in objectively-measured physical activity (PA) in young people.

Methods:

Electronic databases were searched from 01/1990 to 01/2013. We included English language, cross-sectional, longitudinal (baseline data) and intervention studies (baseline data) of children (4-18 years) reporting accelerometer measured PA segmented by day or time of day. Meta-analyses of standardised mean differences (SMD) between time-segments for average accelerometer counts per minute (relative PA; CPM) and minutes in moderate-to-vigorous PA (absolute PA; MVPA) were conducted. Heterogeneity was explored using meta-regression. Studies not eligible for meta-analysis, but that included a statistical comparison were synthesised descriptively.

Results:

Of 55 included studies, 38 were eligible for meta-analyses. Children were more active on school days than weekends (pooled SMD (95% CI) CPM 0.15 (0.08;0.23), MVPA 0.43 (0.36;0.50)). On school days, relative PA was lower in-school than out-of-school, however, marginally more absolute PA was accumulated in-school (CPM -0.42 (-0.59;-0.24), MVPA 0.17 (-0.03;0.38)). Relative PA was slightly lower on weekends than out-of-school on school days, but a greater volume of absolute PA was performed on weekends (CPM -0.10 (-0.19;-0.01), MVPA 1.02 (0.82;1.22)). Heterogeneity between studies was high (I² 73.3-96.3%) with 18.3-46.8% of between-study variance attributable to potential moderating factors. Few non-meta-analysed studies statistically tested relevant comparisons, those which did revealed mixed results.

Conclusions:

Notable within- and between-day differences in PA were observed, influenced by the unit of measurement applied. Findings support the tailoring of intervention strategies to specific time periods.

P219

Seasonal changes in primary school children's PA

Authors:

Nicola Ridgers, Anna Timperio, Jo Salmon

Purpose:

Seasonal variations may influence children's physical activity patterns. Research is needed to examine how much physical activity youth engage in across the day and how this varies between seasons to inform the development of physical activity programs. The aim of this study was to investigate seasonal changes in children's physical activity across one school year.

Methods:

Three hundred and twenty-six children aged 8-11 years from nine primary schools in Melbourne, Australia, participated in the study. Physical activity was measured every 15-seconds using hip-mounted GT3X+ ActiGraph accelerometers for seven consecutive days in the winter, spring, summer and autumn school terms. Time spent in moderate- to vigorous-intensity physical activity (MVPA) at each time point was derived using age-specific cut-points. Environmental data

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(maximum temperature, precipitation, daylight hours) were obtained daily during each season. Longitudinal data were analysed using three-level (term, pupil, school) multilevel analyses, adjusted for age, sex, accelerometer wear time, number of valid days, and environmental variables.

Results:

Compared to winter months, children engaged in less MVPA in summer (-7.6 min, %95CI -14.4, -0.8; $p = 0.03$). They also engaged in less MVPA in spring (-11.8 min; $p = 0.08$) and more MVPA in autumn (6.3 min; $p = 0.06$), though this did not reach significance.

Conclusions:

Physical activity decreased in the summer compared to winter, contrasting previous research that typically reports that children are most active in summer. The results suggest that strategies to promote physical activity may be needed in Australia during the hot summer months.

P221

School children's perception towards active video games and its potential values to school PE

Authors:

Patrick Wing Chung Lau, Jing Jing Wang

Purpose:

Active video games (AVG) have been demonstrated significant and positive impact on energy expenditure and physical activity level from laboratory and intervention studies. But there are dearth studies implementing AVG into the education settings. This study aims to investigate school children's perception towards AVG and its potential values to school physical education.

Methods:

300 children aged 8-15 years old (53.3% boys, mean age 11.3 ± 2.4 yrs) were recruited from a shopping mall in Hong Kong. A 5-point Likert scale questionnaire constructed based upon the literatures was conducted to participants right after they finished AVG play (either Table Tennis, Beach Volleyball or Golf) on the contents of: a) Student's perception to AVG, b) their views on AVG adopted into school PE lesson. The t-test was performed to examine the gender and age differences.

Results:

85.0% of participants reported they like playing AVG and 59.8% reported higher self-esteem after playing. The mean scores of the perceptions to AVG were: Interesting= 4.2 ± 0.89 ; encourage to be more active= 4.0 ± 0.97 ; challenging= 4.0 ± 1.10 . The mean scores of their views on AVG adopted into school PE lesson were: Health behavior promotion= 3.6 ± 0.94 ; sports skills and knowledge= 3.8 ± 0.92 ; social-psychological value= 3.8 ± 0.85 , teaching and learning value= 4.0 ± 0.88 and negative impacts= 2.4 ± 1.17 . Compared to 12-15yrs, 8-11yrs old children had more favorable responses towards AVG adopted into school PE lessons. All the scores didn't differ within gender groups.

Conclusions:

AVG shows the good acceptability among children and can motivate them to participate in more physical activities. Also, it is a potential educational tool in school setting integrated in physical education.

P222

Physically active and inactive 11-year-old children-are the correlates dependent on the measurement method?

Authors:

Suvi Määttä, Teija Nuutinen, Carola Ray, Johan Eriksson, Elisabete Weiderpass, Eva Roos

Purpose:

This study explored the individual, parental, and physical environmental correlates associated with self-reported ('reported') and objectively measured ('recorded') out-of-school physical activity (PA) in a sample of 11-year-old children.

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Methods:

In spring 2013, a total of 155 children wore an accelerometer seven days and completed a questionnaire of their PA and potential correlates (e.g. parental encouragement, television viewing, and computer use). Parental education was informed by parents. Weather information was collected from each day of accelerometer use. Dichotomous variables for reported and recorded PA were formed (the highest active quartile-other and the lowest quartile and other). Logistic regression analyses were applied to test associations.

Results:

Same correlates were associated with lowest physically active children despite measurement method. These correlates were lower perceived mother's PA, lower parental encouragement for PA, more television viewing and computer use. On the contrary, computer use and television viewing were inversely associated with both the highest recorded and reported PA. Other correlates were associated with either reported or recorded PA. Following correlates increased the odds of having the highest recorded PA: Boys, the higher educated mothers, snowless conditions, warmer temperatures, and the day length. Respectively, the higher perceived parental PA and encouragement for PA were associated with higher reported PA.

Conclusions:

Same correlates were associated with the high and low PA levels, but the associations were reverse. The lowest active had same correlates despite measurement method whereas high PA correlates varied. This study suggests that focus on parental correlates might be beneficial in preventive interventions.

P223

Seasonal variation in sedentary time across the primary/secondary school transition in Scotland

Authors:

Paul McCrorie, Ceri Sellers, Ben Stansfield

Purpose:

There is little evidence of changes in young people's sedentary times between seasons. It was hypothesised that sedentary time would be lower in summer compared to winter, and accumulated in shorter bouts.

Methods:

Primary (n=17, 10.9yrs) and secondary (n=36, 12.2yrs) children wore (24hrs) an activity monitor (activPAL) for 3 school days in winter and summer. Total time sedentary and bout length accumulation (bouts >20, 30 and 60 minutes) were extracted for the waking day (06:00-00:00), school (09:00-15:00/15:25; primary/ secondary), and after school hours (15:00/15:25-00:00).

Results:

Primary children were more sedentary in winter during the waking day (535mins v 480mins, $p=0.002$). Although in the hypothesised direction, no significant school seasonal differences were found for this group. Primary children were, however, more sedentary after school in winter (273mins v 226mins, $p<0.001$), 98 minutes of which was accumulated in bouts >20 minutes in length (summer: 72mins, $p=0.04$). Conversely, secondary children were more sedentary in the summer waking period (586mins v 569mins, ns). The source of this seasonal pattern was within school hours (263mins v 240mins, $p<0.001$), with >50% of school summer time accumulated in bouts >20 minutes in length (41% in winter, $p<0.001$). The after school period showed no seasonal differences.

Conclusions:

Primary children's seasonal patterns of sedentary time were aligned with our hypothesised direction - less sedentary in summer. However, secondary children were more sedentary in summer (waking/school), and in longer bout lengths (school), suggesting that seasonal changes in the school day may be detrimentally impacting sedentary behavior in this group.

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P224

Influence of aerobic fitness and metabolic syndrome risk factors on cognitive control in elementary age children

Authors:

Mark R. Scudder, Naiman A. Khan, Kate Lambourne, Eric S. Drollette, Stephen D. Herrmann, Jessica L. Betts, Richard A. Washburn, Joseph E. Donnelly, Charles H. Hillman

Purpose:

Approximately 60% of children in the US have at least one risk factor of metabolic syndrome (MetS), placing them at greater risk of developing type-II diabetes and cardiovascular disease. Although MetS is associated with decreased cognitive and brain health in adults, the implications of metabolic risk on specific aspects of children's cognitive control have received little attention.

Methods:

Second and third grade students ($n = 139$) performed a modified flanker task to assess cognitive control. Hierarchical regression analyses, which included demographic variables, aerobic fitness, and MetS risk factors were conducted for accuracy and reaction time (RT). Flanker performance was further contrasted between children with at least one MetS risk factor ($n = 69$; mean # of risk factors ~ 1.5), and those with no risk ($n = 70$).

Results:

Flanker RT was significantly correlated with aerobic fitness ($r's \geq -.26$), HDL cholesterol ($r's \geq -.27$), and triglyceride levels ($r's \geq .21$). However, regression analyses revealed that only fitness and HDL accounted for a significant proportion of the variance following inclusion of demographic factors. Group comparisons further revealed that children with at least one risk factor exhibited longer RT ($\sim 48ms$) and less accuracy as task difficulty was elevated, compared to children with no risk.

Conclusions:

The findings indicate that children at risk for MetS exhibit lower cognitive control for inhibition and flexibility. In addition to aerobic fitness, HDL may serve as a useful biomarker for characterizing the cognitive implications of increased MetS risk in developing children. Support by: NIH DK085317

P225

Physical activity habits of children from Plan de San Luis primary school, Tijuana Mexico

Authors:

Elvira-Ivonne Murillo-Rabago, Lucia-Margarita Valenzuela-Salas, Amanda Davila-Lezama, Janneth-Jackeline Muñoz-Vázquez, Amaranta-Yaritza Morales-Suarez, María-Carmen Hoyos-Luna

Purpose:

The purpose of this study was to identify habits of physical activity (PA) and its impact on the prevalence of overweight and obesity in primary school children of Plan de San Luis in 2013.

Methods:

A cross-sectional study was conducted to 110 scholars, where a survey was applied to obtain information related to their PA habits. Height and weight were assessed by conventional methods and BMI (kg/m^2) was calculated. The results were analyzed using the Spearman correlation coefficient with SPSS version 19.0.

Results:

The average age was 10.2 years, where 59.1% were boys. These data showed that 12.7% presented malnutrition, 51.8% normal weight, 16.4% overweight and 19.1% were obese. Also, 39.1% practiced a vigorous sport activity, 61.8% at least one hour of PA daily, 35.5% less than an hour and 2.7% none. From those who exercised, 71.9% practiced in school and 28.01% in extracurricular areas. An association was observed between PA in hours per day with the practice in school areas ($p < 0.05$) and with boys ($p = 0.05$). There was no association between BMI and the time of PA in this population with those who practiced any vigorous sport in school or in another area.

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Conclusions:

These findings indicate that the majority of children that carry out the recommendations of PA, are performed in school areas, which demonstrates the need to examine the PA programs, to achieve a decrease in overweight and obesity rates; furthermore, include PA strategies outside of school.

P226

Promoting physical activity across France - The 'McDo Kids Sport'

Author:

Paul Gately

Purpose:

The WHO (2005) has called for all stakeholders (public and private) to; (i) increase awareness of the benefits of physical activity (PA); (ii) encourage the development, strengthening and implementation of action plans to increase PA; and (iii) monitor the outcomes of PA interventions.

Methods:

Through its partnership with the National Olympic and Sports Committee, McDonald's France embarked on a national campaign to promote PA to children across France during the summer of 2013. We report an overview of the program and intervention outcomes. From April to September the program provided the opportunity for children to experience 4 Olympic disciplines: Athletics, cycling, judo, basket-ball; in addition to a multisport area. "Move it" educational workshops and a range of resources were also provided to increase engagement. Qualified sports coaches were enrolled to ensure a high standard of delivery and engagement. Engagement was made with local sports/PA clubs to enable long term participation.

Results:

33,342 children participated in 127 events. 380 local clubs were involved in the events, of these 60% of clubs tracked transition from the 'McDo Kids Sport' program to clubs participation.

Conclusions:

These initial outcomes show the ability of organisations like McDonald's to promote PA awareness and engagement as requested in the WHO Diet and Physical Activity Strategy. The reach and engagement of the programme and the reported transition to local sports clubs demonstrates the potential of this approach. Further research is clearly necessary to understand the impact of the intervention on long term participation.

Post-Illness Recovery & Activity

P227

Needs support from family and physicians and levels of self-determined motivation toward specific health behaviors of patients with heart disease

Authors:

Claudie Emond, Elisabeth Wilshire, Gilles Lalande, Luc G. Pelletier

Purpose:

Examination of the relation between needs support (autonomy, competence, relatedness) from family and physicians and health behaviors specific motivation: Physical activity (PA), healthy eating behaviors (HEB) and medication adherence (MA) with cardiac patients. Also, to determine whether support from the family is a better predictor of specific motivation than from physicians. This study is the first one exploring relations between these variables with this population.

Methods:

Participants: 270 (average age=61.2). Inclusion criteria: Between 18 and 75 years of age, heart disease diagnosis, hos-

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pitalized. Exclusion criteria: Debilitating illness, severe mental disorder. The measures were obtained in a follow-up 3 months after hospitalization. Perceptions of needs support (family and physicians) were measured with Interpersonal Behaviors Questionnaire (Pelletier et al., in preparation) and the levels of self-determined motivation for 3 specific health behaviors were measured with the short version of self-regulation questionnaire (adapted from Sheldon, Ryan & Reis, 1996). Data analysis used multiple regression.

Results:

This research provides evidence that support from the family predicts motivations toward PA and MA. Analysis also reveals that support by the family is a better predictor of specific motivation. Finally, results suggest that competence support is the most reliable predictor of motivation for health behaviors.

Conclusions:

The results confirm the crucial role of the family as well as the contribution of competence support on specific motivation for cardiac patients. Implications for interventions are in favour of including families in cardiac rehabilitation programs and promoting competence support. Future research should examine other factors related to specific motivation.

P228

“They say we’re the lucky ones”: Physical activity barriers in people with an incomplete spinal cord injury

Authors:

Anthony Papathomas, Brett Smith

Purpose:

An incomplete spinal cord injury (SCI) represents a partial rupture of the spinal cord and the preservation of some neurological function below the site of injury. Although some incomplete spinal injured people are ambulant, they still face significant barriers to a physically active lifestyle. This research is the first to provide an exclusive focus on the physical activity experiences of incomplete SCI people.

Methods:

A total of 6 (2 female) ambulant incomplete spinal injured participants (average of 40 years of age) were selected from a broader study exploring the physical activity experiences of SCI individuals. Semi-structured interviews encouraged participants to reflect on their physical activity motivations and behaviors. Interviews lasted between 100 and 133 minutes, with each digitally recorded and transcribed verbatim. Over 10 hours of interview data was subject to rigorous thematic content analysis.

Results:

Participant experiences were reflected in four major themes; 1) Health professionals underestimate their disability 2) Perceived poor wheelchair skills restrict opportunities 3) Weak group identity and 4) Increased community stigma.

Conclusions:

Physical activity promotion should not assume that engaging in exercise is any easier for incomplete SCI people than those with a complete injury. Incomplete SCI presents with its own unique physical activity barriers and exercise intervention strategies must be sensitive to these. Practical recommendations for increasing physical activity levels in the incomplete SCI population are offered.

P229

It reminded me to exercise: Engagement and acceptability of a mHealth exercise intervention for adults with ischemic heart disease

Authors:

Leila Pfaeffli Dale, Ralph Maddison, Robyn Whittaker, Ralph Stewart, Andrew Kerr, Yannan Jiang, Karen Carter

Purpose:

Little research has investigated the potential of mobile technologies (mHealth) to encourage behavior change for sec-

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ondary prevention of ischaemic heart disease (IHD). The HEART trial examined the efficacy of a mHealth intervention to increase exercise behavior in adults with IHD. A mixed methods sub-study was completed to evaluate the usability and participant perceptions of the intervention.

Methods:

171 adults with IHD were recruited into a 6-month randomized controlled trial, to receive either a mHealth intervention or usual care. The HEART intervention delivered a theory-based, automated package of exercise prescription and behavior change text messages along with a supporting website. To assess perceptions of the intervention, participants in the treatment group completed a feedback survey and semi-structured exit interviews during their follow-up assessment.

Results:

At the end of the intervention period, 75 participants completed the feedback survey and 17 participants were interviewed. Descriptive and frequency information from the survey data were merged with qualitative data, analysed using a general inductive approach, resulting in 3 overarching themes: 1) Participants engaged with the technology and found it easy to use; 2) It motivated participants to exercise; 3) The intervention could be improved through further tailoring and including some personal contact.

Conclusions:

Adults with IHD enjoyed and were able to use a mHealth program to receive exercise information and support. While mHealth is designed to be automated, programs could be improved if content and delivery was tailored to individuals' needs.

P230

The effect of depression/anxiety on physical activity in breast cancer patients

Authors:

Robyn Laczy, Timothy Jason, Melanie Keats, Daniel Rainham, Tallal Younis, Daniel Rayson, Arik Drucker, Chris Blanchard

Purpose:

The potential health benefits of physical activity (PA) for women with breast cancer may be reduced by related symptoms of depression and anxiety. The purpose of this study was to examine the relationship between total Hospital Anxiety and Depression Scale (HADS) scores on depression and anxiety and PA measured objectively in female breast cancer patients (BCPs) at the Nova Scotia Cancer Centre in Halifax, Canada.

Methods:

To date, we have recruited 49 participants for a study examining PA in BCPs residing in Nova Scotia. For this submission, we report preliminary baseline data from 42 participants (mean age=56 years; mean BMI=27.5 kg/m²) who completed a questionnaire and wore an Actigraph accelerometer for nine days. The first and last days of wear time were excluded in order to calculate the average minutes per day of moderate-to-vigorous PA (MVPA) (mean=44 minutes).

Results:

A multiple regression test on average minutes per day of MVPA with depression and anxiety as the predictors and BMI as a covariate yielded a significant R of 0.50, $F(3,31) = 3.38$, $p < .05$. The overall model fit was $R^2 = 0.25$. In the context of the model, total scores on depression ($\beta = -.60$, $p < .05$) and total scores on anxiety ($\beta = .61$, $p < .05$) significantly predicted average minutes per day of MVPA.

Conclusions:

According to the results, anxiety is positively associated with MVPA while depression is negatively associated with MVPA. This indicates the importance of assessing symptoms and targeting interventions separately instead of globally for depression and anxiety in BCPs.

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Social ecological predictors of achieving physical activity guidelines in a sample of cardiac rehabilitation patients

Authors:

Timothy Jason, Jessie MacKay, Daniel Rainham, Nicholas Giacomantonio, Chris Blanchard

Purpose:

Research on physical activity (PA) in people with heart disease tends to emphasize intrapersonal correlates while largely ignoring the potential importance of higher-level correlates within the social ecological model. Thus, the purpose of this study was to determine the relative importance of several social ecological correlates in predicting whether or not PA guidelines were reached in a sample of cardiac rehabilitation (CR) patients.

Methods:

To date, we have recruited 201 participants as part of a larger study examining PA in CR patients. For this submission, we report results based on 152 participants (mean age = 64 years; mean BMI = 29 kg/m²) who completed a questionnaire and wore an Actigraph accelerometer for nine days at the beginning of their CR program. The total time spent in bouts of at least 10 minutes was dichotomized into greater than or equal to 150 minutes (1) or less than 150 minutes (0).

Results:

A logistic regression test yielded a model that included two intrapersonal predictors (BMI and self-efficacy) and four community-level predictors (neighbourhood characteristics and crime, access to a community center or fields), $\chi^2(6, N = 152) = 37, p < .05$. Overall classification was impressive at 80%. In the context of the predictive model, BMI, self-efficacy and access to a community center significantly predicted whether or not PA guidelines had been reached, $p < .05$.

Conclusions:

Results indicate that higher-level factors such as access to community activity spaces should be considered alongside intrapersonal factors as key correlates of PA in people with heart disease.

P232

A systematic gender-based review of physical activity correlates in coronary heart disease patients

Authors:

Timothy Jason, Kerry McGannon, Daniel Rainham, Gail Dechman, Chris Blanchard

Purpose:

Coronary heart disease is the leading cause of death worldwide due largely to insufficient cardiovascular fitness gained via physical activity (PA). Efforts to promote PA in men and women with heart disease should be informed by research identifying the key correlates of PA. Thus, the objective was to provide a systematic gender-based review of PA correlates in men and women with heart disease.

Methods:

English-language peer-reviewed publications from January of 1990 to January of 2013 were obtained using the EBSCO Host platform, PUBMED, and PROQUEST. The literature search involved systematic combinations of keywords related to PA, heart disease and gender. Eligibility criteria for inclusion of articles were studies with: Adult participants (>18 years); an explicit definition for heart disease; an explicit measure of PA; and at least one gender-based correlate of PA. The social ecological model was used to organize the PA correlates.

Results:

Despite certain methodological challenges and inconsistencies across studies, findings indicated that physical activity is largely influenced by intrapersonal correlates. Furthermore, physical activity appears to be influenced by prevailing gender-based roles and gendered help-seeking for health behaviors.

Conclusions:

The design and development of PA interventions from a gender-based social ecological perspective recognizes the multiple and dynamic influences on a person's behavior and thus may provide a foundation from which to increase and sustain PA in men and women with heart disease. Creating supportive environments for PA and normalizing PA are necessary steps to addressing the lack of PA in this population.

P233

Relationships between exercise, healthy eating behaviors and mental health in a population of patients with heart disease

Authors:

Gilles Lalande, Claude Simard, Claudie Emond, Luc G. Pelletier

Purpose:

Determine whether physical activity (PA) and healthy eating behaviors (HEB) represent significant predictors of mental health for patients with heart disease. Few researches have studied the impact of these variables on mental health and even fewer with cardiac patients.

Methods:

Participants: 277 patients (225 □ and 52 □, average age = 61.4). Inclusion criteria: Being between 18 and 75 years of age, having received a heart disease diagnosis, being hospitalized. Exclusion criteria: Deliberating illness, severe mental disorder. The study began immediately after hospitalization and included one follow-up 12 months later. The data were collected using: Exercise Behavior (Godin & Shepard, 1985), Healthy Eating Behavior (Pelletier et al., 2004), Well Being (Ryff & Essex, 1992), Life Satisfaction (Diener et al., 1985), Symptoms Distress (Ilfeld, 1976). Data analysis used multiple regression.

Results:

This research provides evidence that the participants engaged mainly in light physical activity (without the support of a rehabilitation program) and that both exercise behaviors and healthy eating behaviors predicted better mental health. Analysis suggests that HEB represents a more reliable and significant predictor than PA. Findings suggest that patients who have positively changed their HEB show also an increase in their mental health.

Conclusions:

These results confirm that HEB and PA are effective predictors of mental health for cardiac patients. Implications for interventions are in favor of offering environments that provide support for initiating and maintaining HEB and PA. Future research should examine the impact of other factors related to mental health.

P234

Physical activity among heart failure patients in the Longitudinal Aging Study Amsterdam

Authors:

Rony Oosterom-Calo, Saskia te Velde, Martijn Huisman, Wim Stut, Marjolein Visser, Dorly Deeg, Johannes Brug

Purpose:

Sufficient physical activity (PA) is important for the management of heart failure (HF). Information about the prevalence of the target behavior is necessary to inform intervention development. Therefore, this study assessed PA among HF patients in the Netherlands.

Methods:

Data from a population-based cohort study, the Longitudinal Aging Study Amsterdam (LASA), collected between 2001-2009 through interviews and medical records, was used. HF was identified based on self-reported symptoms, medical records and prescribed medications. PA was measured with the validated LASA Physical Activity Questionnaire, addressing walking, cycling, sports activities, light and heavy household activities and gardening. Descriptive statistics were conducted.

Results:

The sample included 182 patients; 42.9% male and mean age 79.1 years (standard deviation (SD) 8.06). Patients conducted a mean of 56 (SD 45) minutes of total PA. The median (M) was 50 weekly minutes (interquartile range (IQR) 19, 80). Twenty patients (11%) reported performing no weekly activity. M was 0 weekly minutes (IQR 0, 0) for cycling, sports activities, heavy household activities, and gardening. The light household activities' M was also 0 weekly minutes

(IQR 0, 15). Finally, M walking time was 2 weekly minutes (IRQ 0, 10).

Conclusions:

PA levels are low among HF patients: The mean and median weekly minutes of total PA are low and most studied activities were not performed at all by most patients. Reasons for the low performance of activities should be investigated to further inform intervention development.

P235

Spinal Cord Injury, auto-photography and the struggle to be physically active

Authors:

Anthony Papathomas, Brett Smith

Purpose:

A traumatic spinal cord injury (SCI) is a life changing event that leads to paralysis and a range of physical (e.g. chronic pain) and psychological (e.g. depression) consequences. Although physical activity has been shown to alleviate many of these debilitating issues, spinal injured people have been identified as the most inactive members of society. Understanding what motivates SCI people to be more physically active in the face of great barriers is an on-going challenge for researchers.

Methods:

Auto-photography, also known as photo elicitation, is an innovative and emergent qualitative research method whereby participants take personal photographs to reflect their perceptions of a given issue. In this case, 15 SCI participants were asked to provide 5 photos for each of the following 3 categories: a) What makes physical activity difficult? b) What makes physical activity easier? and c) What does physical activity mean to me? Each photo was then used to elicit rich personal narratives from each respective participant.

Results:

Participant photographs highlighted a wide range of barriers and facilitators to physical activity. Physical obstacles such as broken lifts and poorly maintained sidewalks were the most commonly depicted barriers, whereas green, outdoor spaces and socially inclusive scenes proved the most popular physical activity facilitators. Photographs also stood alone as theory-rich artefacts inviting further interpretation from the independent viewer.

Conclusions:

Auto-photography can provide novel insights into SCI people's motivation for physical activity and can work as a powerful communicative tool for academics, physical activity intervention strategists and policy-makers alike.

P236

Developing a UK feasibility trial of a dietary and physical activity intervention in men with prostate cancer: Findings from a systematic review and qualitative interviews

Authors:

Lucy Hackshaw-McGeagh, Rachel Perry, Verity Andrews, Eileen Sutton, Athene Lane, Richard Martin

Purpose:

Prostate cancer (PC) is the most common male cancer in the Western world. Dietary and physical activity (PA) interventions have demonstrated positive outcomes in other cancer patients, such as prevention of progression, and could have similar positive outcomes for men with PC.

Methods:

Systematic searches of five electronic databases for papers reporting findings of dietary and PA interventions to prevent progression of PC. Data from included papers were extracted, analysed and synthesised. Interviews with PC patients, their partners and health care professionals (n= 34) explored previous experience with interventions, as well as facilitators and barriers to change. Thematic analysis, using a framework approach, was used to identify key issues.

Results:

A total of 9404 papers were identified; 40 (0.4%) were included. Findings highlighted the heterogeneity of dietary and PA interventions. Those that included brisk walking and increasing lycopene intake were more likely to result in positive outcomes. Patients had varied experiences of past interventions and considered interventions focused on walking and increased lycopene intake easy to implement. Barriers included lack of time, whilst trust in professionals was perceived to facilitate positive changes.

Conclusions:

Easy to implement interventions would be welcomed but addressing barriers will be necessary to achieve success. Findings from this study are being used to inform the development of a feasibility trial of a dietary and PA intervention in men with prostate cancer.

P237

Recovery of PA levels 3 months after total hip replacement

Authors:

Artaban Jeldi, Margaret Grant, Malcolm Granat, David McDonald, Angela Deakin, David Allen, Ben Stansfield

Purpose:

Hip osteoarthritis severely affects mobility due to pain, potentially reducing free-living physical activity (FL-PA). Total hip replacement (THR) has been demonstrated to reduce pain and improve strength and flexibility. However, little attention has focussed on how these improvements impact on FL-PA. The purpose of this study was to objectively measure FL-PA after THR.

Methods:

FL-PA of 30 patients undergoing THR (21F/9M, mean 67y range 50-82y) was objectively measured (activPAL, PAL Technologies, UK) pre-operatively (3-7d) and 3 months post-operatively (5-7d). The average daily time spent sitting/lying, upright, standing and stepping, steps (with cadence), longest upright bout and largest number of steps in a continuous upright bout were calculated. Comparisons were made using Mann-Whitney U, $p < 0.05$ with results reported as median[IQR].

Results:

The only significant difference in FL-PA between pre- and 3 months post-operative was an increase in average cadence of stepping (76[73-82]:82[77-87] steps/min, $p=0.010$). There was no significant change in the time per day spent sitting/lying (19.05[16.82-20.02]:18.36[17.27-19.32]h, $p=0.564$), upright (4.95[3.98-7.18]:5.64[4.68-6.73]h, $p=0.564$), standing (3.74[2.97-4.83]:3.84[3.35-4.68]h, $p=0.506$) or stepping (1.36[0.65-1.61]:1.33[0.86-1.68]h, $p=0.515$). Nor was there any change in steps/day (5852[2819-6459]:5710[3950-7138] steps/day, $p=0.294$), longest upright bout (1.47[0.90-2.11]:1.39[1.05-2.15]h, $p=0.912$) and largest number of steps in a continuous upright bout (1712[832-3018]:2135[1503-3690] steps, $p=0.165$).

Conclusions:

Improvements in FL-PA are not observed 3 months following THR surgery. Pain reduction and strength and flexibility improvements do not appear to result in any increase in FL-PA. Whilst these are early post-operative results, there is an indication that interventions may be required to increase FL-PA towards levels recommended for long term health.

P238

Physical disability and weight status in low back pain patients: Preliminary results

Authors:

Ana Queralt, Daniel Sánchez-Zuriaga, M^a Ángeles Pamblanco, Pilar Serra, Alexandre Cortés, Lirios Dueñas, Cecili Macián

Purpose:

To analyze the level of physical disability, independence and pain intensity during walking, and weight status in a sample of low back pain patients.

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Methods:

The sample of this cross-sectional study consisted of 47 low back pain patients (22 male and 25 female; 44.8 years). Height, weight and body fat percentage were measured and BMI was calculated. The Oswestry low back pain disability questionnaire and the Million Visual Analog Scale were administered. We selected two items related to independence and pain intensity during walking from the Oswestry questionnaire and the Million Scale, respectively, and classified the sample in two groups. T-tests were performed.

Results:

The prevalence of overweight and obesity was 68.1%. Considering Oswestry classification of disability, 42.6% of the sample had minimal disability, 36.2% had moderate disability, 17.0% had severe disability and 4.3% was classified as being crippled. Patients who had higher pain intensity when walking (40.4%) had higher BMI than those classified as having lower pain intensity (28.7 vs. 26.1; $p < 0.05$). Furthermore, those patients classified as having more independence during walking (76.6%) had lower BMI (26.4 vs. 29.7; $p < 0.05$).

Conclusions:

The prevalence of overweight and obesity in low back pain patients is high. Promoting physical activity among low back pain patients could be a good strategy to improve weight status.

P239

The relationship between sedentary behavior and quality of life in a sample of cardiac rehab patients

Authors:

Jessie MacKay, Timothy Jason, Daniel Rainham, Nicholas Giacomantonio, Chris Blanchard

Purpose:

People with heart disease tend to experience a reduced health-related quality of life (QOL). Regular physical activity (PA) has been linked to improved outcomes, but little is known regarding the role of sedentary behavior. The objective of this study was to examine the association between sedentary behavior and QOL in a sample of cardiac rehabilitation (CR) patients.

Methods:

To date, we have recruited 201 participants for a study examining PA in CR patients. For this submission, we report results based on 152 participants (mean age = 64 years; mean BMI = 29 kg/m²) who completed a questionnaire and wore an Actigraph accelerometer for nine days at the beginning of their CR program. Seven days of wear-time data were selected in order to calculate the percentage of total wear time engaged in sedentary behavior (mean = 80%). Five questionnaire items measuring quality of life (QOL) were summed to yield a total score.

Results:

A multiple regression test on QOL with % sedentary as the predictor and age and BMI as covariates yielded a significant R of 0.30, $F(3,141) = 4.50$, $p < .05$. In the context of the model, age ($\beta = 0.25$, $p < .05$) and % sedentary ($\beta = -0.22$, $p < .05$) significantly predicted QOL.

Conclusions:

According to the results, a greater percentage of time being sedentary is associated with a reduced QOL in a sample of CR patients. This further indicates the importance of promoting physical activity as a means to enhance the QOL of people with heart disease.

POSTERS

P240

Associations between physical activity and posttraumatic growth in gynecologic cancer survivors

Authors:

Jennifer Crawford, Jeff Vallance, Nick Holt, Kerry Courneya

Purpose:

Numerous physical and psychological benefits of physical activity (PA) for cancer survivors have been documented; however, few studies to date have examined posttraumatic growth (PTG). The primary objective of this study was to examine the association between PA and various indicators of PTG in gynecologic cancer survivors (GCS).

Methods:

The Alberta Cancer Registry generated a random sample of 2,064 GCS stratified by cancer type (688 from each survivor group) who were mailed a survey that assessed standard demographic and medical variables, the Godin Leisure Time Exercise Questionnaire, and several PTG scales.

Results:

Completed surveys were received from 621 (38%) of the 1,626 eligible GCS, of whom 32.9% were meeting aerobic exercise guidelines, 19.0% were meeting strength exercise guidelines, and 11.1% were meeting both exercise guidelines. After adjustments for key demographic and medical covariates, analyses of covariance indicated significant differences in PTG based on meeting the aerobic exercise guidelines for the Negative Impact of Cancer Scale ($p < 0.001$) and several of its subscales. Analyses of covariance also indicated significant differences based on meeting the strength exercise guidelines for the Post Traumatic Growth Inventory subscales of new possibilities ($p = 0.015$) and appreciation for life ($p = 0.023$). Finally, results showed that those meeting both exercise guidelines reported higher Post Traumatic Growth Inventory total scores than those meeting only one or no guideline ($p = 0.014$).

Conclusions:

PA is a modifiable lifestyle factor that may facilitate PTG. A combination of both aerobic and strength exercises may result in higher levels of PTG in GCS.

Thursday, May 22, 2014 - 19:00-20:30

Young Adult/College Physical Activity & Nutrition

P241

Impact of a habit-focused informational intervention on fruit and vegetable consumption among university students: A randomized controlled trial

Authors:

Christopher Rompotis, Robert Grove, Susan Byrne

Purpose:

To assess the effectiveness of a habit-based intervention delivered by e-mail or sms in improving fruit and vegetable consumption in young adults.

Methods:

An 8-week randomised controlled trial compared the effectiveness of three different types of message content (habit-based messages; food-group messages; general healthy eating messages), and two delivery methods (e-mail versus sms) on habit strength and consumption of fruits and vegetables in 71 undergraduate participants.

Results:

A significant message content by time interaction indicated that the habit-based intervention improved fruit consumption over the 8-week period. Vegetable consumption significantly increased over the intervention period regardless of message content. Delivery method did not influence these results.

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Conclusions:

Messages based on a habit framework can be utilised to improve fruit consumption in young adults. Furthermore, simply reminding young adults to be conscious of their food choices may be sufficient for improving their overall vegetable consumption.

P242

Energy drink consumption is associated with anxiety in Australian young adult males

Authors:

Gina Trapp, Karina Allen, Therese O'Sullivan, Monique Robinson, Peter Jacoby, Wendy Oddy

Purpose:

Energy drinks are predominantly targeted to young adult consumers however there has been limited research into their effects on psychological functioning in this demographic group. This study examined cross-sectional associations between energy drink consumption and mental health in a population-based sample of young adults participating in the Western Australian Pregnancy Cohort (Raine) Study.

Methods:

We used self-report questionnaires to assess energy drink consumption and mental health (Depression Anxiety Stress Scale-21; DASS-21) at the 20 year cohort follow-up. In the regression analyses, we considered associations between energy drink consumption (mL/day) and continuous DASS-21 scores, adjusting for socio-demographic variables, alcohol and drug use, physical activity, body mass index (BMI) and dietary intake. Our sample included 502 males and 567 females (mean age 20±3 years).

Results:

After adjusting for potential confounding factors and controlling for co-existing mental health problems, energy drink consumption (per 100mL/day) was significantly associated with anxiety (but not depression or stress), and this relationship was found only in males ($B = 0.32$; 95% CI = 0.05, 0.58).

Conclusions:

Our study found that energy drink consumption was associated with increased anxiety in young adult males. Further research into the possible contribution of energy drink use to the development of mental health problems in young adults is needed.

P243

Sport team participation nurtures need satisfaction and predicts self-esteem during transition to university

Authors:

Jennifer Zering, Steven Bray

Purpose:

Transition to university is associated with negative effects on health behaviors (physical activity, tobacco use) and mental health. According to self-determination theory, satisfaction of fundamental needs (autonomy, competence & relatedness) is positively associated with psychological well-being. Participation on sport teams may provide opportunities for need satisfaction and, thus, have implications for psychological well-being. The purpose of this study was to examine relationships between need satisfaction and self-esteem during first-year university. We investigated need satisfaction across social group domains including: Housemates, classmates, family, and sport teammates. It was hypothesized that sport teams would be among the sources of need satisfaction predicting self-esteem.

Methods:

Students (N=164) completed measures of need satisfaction (LaGuardia et al., 2000) and self-esteem (SDQIII) at the midpoint of their first semester at university. A subsample (n = 115) indicating that they were currently involved with sport teams was selected for further analysis.

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Results:

Stepwise multiple regression predicting self-esteem from need satisfaction indicators showed three significant predictors: Competence from housemates, autonomy from classmates, and competence from sport teammates ($R^2 = 31.80$, $F(1, 108) = 7.19$, $p = .008$). The predictors accounted for 19.8%, 7.5%, and 4.5% of the variance, respectively.

Conclusions:

Need satisfaction across several domains may be important for the development or preservation of psychological well-being during the transition to university. Results suggest that in addition to opportunities for physical activity, sport team participation provides interpersonal experiences that nurture psychological needs. Feelings of competence derived from sport team interactions are positively associated with self-esteem.

P244

The impact of nutrition point of decision prompts in a college cafeteria

Authors:

Shelby Zimmerman, Danielle Perry, Kate Heelan

Purpose:

The purpose is to determine if college students make healthier food choices in a cafeteria setting when foods are labeled red, yellow or green. Freshman weight gain may be attributed to campus cafeteria offerings (Brevard et al., 2005) and lack of nutritional labeling (Kolodinsky et al., 2007). The Stoplight Eating Plan identifies foods as red (high fat and/or high calorie), yellow, or green (low calorie, low fat) based on their nutritional value (Epstein et al., 1988).

Methods:

Videography and digital photography were used to evaluate the number of red and green foods consumed by 152 students during 9 unique meals for baseline. Point of decision prompts were then implemented throughout the cafeteria, labeling individual foods with red, yellow, or green stickers, along with education posters. 139 student meal choices were evaluated while nutrition point of decision prompts were visible in the cafeteria. The number of green and red foods consumed between baseline and during food prompt labeling was compared using t-tests.

Results:

Overall, students consumed 88% of the foods chosen at their meals. Students consumed significantly fewer red food portions (4.1 ± 2.8 v 2.8 ± 2.3 , $p < 0.05$) and significantly more green food portions (2.0 ± 1.8 v 3.0 ± 2.2 , $p < 0.05$) while nutrition decision prompts were visible.

Conclusions:

College students will make healthier food choices when nutrition point of decision prompts are visible in a university cafeteria setting. However, it was noted that there were minimal green food options available to students, making healthy eating a greater challenge in a cafeteria setting.

P245

Young peoples' perceptions of friend and peer influence on nutrition and physical activity behaviors

Authors:

Meg Bruening, Mairya Voytyuk, Jennifer Huberty, Dara James

Purpose:

Studies have found a relationship between friends' and young people's health behaviors; however, it is not clear which mechanisms are involved. To date, no one has assessed qualitatively young peoples' insights on how their friends influence their eating and physical activity (PA). The purpose of this study was to elicit views on possible sociological mechanisms involved in their eating and PA behaviors.

Methods:

Focus groups ($n=10$) were conducted with college freshmen ($n=52$; mean age= 18.7 ± 0.6 ; 50% female) at Arizona State University. Questions addressed broad interpersonal and sociological factors shown to be associated with eating/PA

behaviors among students transitioning into college.

Results:

Several themes emerged in discussing how friends/peers play in students' eating/PA behaviors: Friendship closeness, shared routines/decisions, shared environments, and social cues. Initially, youth reported that their friends' did not influence their eating/PA. However, when discussing how they decide where and when to eat, they reported a group process was involved in making choices: "Someone gets hungry and then we all go to the dining hall". Social cues often determined food choices: "When I saw that my friend ordered pizza, it looked so good, I decided to get it too". Students were more likely to be physically active with friends; this was determined by friend initiation: "When my roommate goes to the gym, I go."

Conclusions:

Cognitively, students were unaware of ways that they were influenced by friends/peers. However, a variety of social mechanisms impacted eating and PA. These factors should be considered when designing interventions with youth and friends.

P246

Examining changes in physical activity, health-related quality of life, and psychological distress of first year university students

Authors:

Paul Sharp, Cristina Caperchione

Purpose:

Once thought to be a period of optimal health, young adulthood is now being associated with numerous health concerns. Individuals transitioning out of high school and into university are most susceptible to disproportionate declines in rates of physical activity. The purpose of this study was to test the effects of a pedometer-based intervention on the physical activity behavior, health-related quality of life (HRQOL), and psychological distress of first year students.

Methods:

First year students that had recently graduated high school (N=184) were randomly assigned to either an intervention or control group. Intervention participants were asked to track their steps on a monthly calendar for 3 months and aim for a daily goal of 10,000 steps. Data were analyzed using split-plot MANOVA/ANOVA.

Results:

The pedometer-based intervention failed to produce a significant difference between the intervention and control group for physical activity, $F(3,165)=1.29$, $p=.28$, HRQOL, $F(2,176)=.22$, $p=.80$, or psychological distress, $F(1,176)=.13$, $p=.72$, from baseline to follow-up. A significant main effect for time indicated that all participants experienced an increase in mild physical activity, $F(1,167)=7.08$, $p<.01$, and psychological distress, $F(1,176)=20.67$, $p<.001$, and a decrease in vigorous physical activity, $F(1,167)=4.13$, $p=.04$, and mental health status, $F(1,177)=16.43$, $p<.001$, across the duration of the study. No change in moderate physical activity, $F(1,167)=.76$, $p=.39$, or physical health status, $F(1,177)=.06$, $p=.81$, was observed.

Conclusions:

These results support the need to address specific health concerns in first-year university students and suggest that a more intensive intervention may be required to elicit change in this population.

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P247

Ultra-processed foods: Associated factors and its influence on nutrient consumption of young adults belonging to the 1982 Pelotas Birth Cohort

Authors:

Renata Bielemann, Gicele Minten, Janaína Motta, Bernardo Horta, Denise Gigante

Purpose:

To evaluate the consumption of ultra-processed foods, the associated factors and its influence on nutrients intake among young adults.

Methods:

The consumption of ultra-processed foods was measured in 2004-5 by the proportion of daily caloric intake attributed to this food group using a food frequency questionnaire. Association between the consumption of ultra-processed food and sociodemographic characteristics and body mass index was evaluated. Influence of ultra-processed foods intake on the consumption of carbohydrates, proteins, fats, cholesterol, dietary fiber, sodium, iron, calcium and total energy was also investigated.

Results:

After exclusion, 4,202 participants of the cohort were included in this study. The consumption of ultra-processed contributed with more than 50% of total calories ingested in both sexes. Sweets and breads were the foods more consumed by women and men, respectively. The consumption of ultra-processed foods was greater among women, subjects with higher schooling, never poor individuals, and eutrophic subjects. Increase in the ultra-processed foods intake was positively associated with consumption of fat, cholesterol, sodium, iron, calcium and calories ($p < 0.001$) and negatively associated with carbohydrates, proteins and dietary fibers intake. As greater the consumption of ultra-processed foods lower was the percentage of subjects with appropriate consumption of carbohydrates, fats, dietary fibers, cholesterol and sodium and greater the appropriate consumption of proteins, iron and calcium.

Conclusions:

The consumption of ultra-processed foods contributed to a high percentage of daily caloric intake of these individuals. The positive influence of this consumption on studied nutrients draws attention to follow these participants.

P248

An interdisciplinary university course: It's all about the bike - public health and sustainability

Author:

Sharon Brown

Purpose:

The results of the 2012 American Community Survey reported a 10% increase in the number of people in the US who bike as a form of active transport in the last year and a 61.6% increase since 2000. A four-week university course, which culminated in a 4 day, 200-mile cycling trip was developed to prepare college students to participate in the increasing number of people in the US who cycle for fitness and transportation.

Methods:

Class lectures, readings, and assignments highlighted cycling topics on physiological adaptations, health benefits, the built environment, sustainability benefits, injury prevention, bike safety, and public policies. Course evaluations, interviews, and online surveys were used to assess the impact of the course.

Results:

Students improved their cardiorespiratory fitness and reported an increased appreciation of the local landscape. As a result of the class students use their bikes to commute to work or school, to participate in community bike events, to compete in triathlons, and to ride for physical activity. Social media conversations identify that students continue to post bike activities, share current cycling news, and discuss bike safety. Campus tours for prospective students now include a tour of the university bike shop and highlight the course as an example of a unique liberal arts course.

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Conclusions:

Providing college students with knowledge, skills, and opportunities to connect with the cycling community will contribute to the growing cycling culture in the US which can lead to improved public health and promotion of a more sustainable lifestyle.

P249

Intake of sugar-sweetened beverages in young adults: Who are more likely to consume?

Authors:

Amelia Hanbury, Carol Boushey, Christina Pollard, Edward Delp, Peter Howat, Satvinder Dhaliwal, Katherine Kerr, Deborah Kerr

Purpose:

The intake of sugar-sweetened beverages (SSB) has been positively associated with overweight and obesity. We aimed to assess the perception of diet and intake of SSB among a population-based sample of young adults (18-30 years).

Methods:

A single item on a validated questionnaire asked "Which statement best describes how you feel about your diet?" Participants selected from 4 options. Participants used a specifically designed mobile application to collect a 4-day image-based food record. One serve of SSB was equivalent to 600kJ. Multivariate regression was used (dependant variable: Serves of SSB).

Results:

The mean BMI was $24.7\text{kg/m}^2 \pm 4.4$ and $24.1\text{kg/m}^2 \pm 5.8$ among the 85 men and 162 women, respectively. The mean daily intake of SSB was 0.55 ± 0.65 serves (range=0-3) for men and 0.45 ± 0.59 serves (range=0-4) for women. There were statistically significant differences in the mean daily intake of SSB between those who reported 'paying a lot of attention to the health aspects of the food they eat' (0.25 ± 0.4 serves) compared to those who 'don't think at all about the health aspect of the food they eat' (1.4 ± 0.8 serves) ($p < 0.0001$) and those who 'don't really think much about the health aspect of food they eat' (0.61 ± 0.7 serves) ($p = 0.007$). Whereas, there was no significant difference between those who take 'a bit of notice' (0.47 ± 0.6 serves) ($p = 0.051$). The results were not confounded by age, gender or weight.

Conclusions:

These findings suggest that young adults who pay more attention to the health aspects of the food they eat are likely to consume significantly less sugar-sweetened beverages.

P250

Motivation to compete is related to how female college athletes eat

Authors:

Amy Frith, Srijana KC, Nicolena Efthymiou, Miranda Kaye

Purpose:

To determine if avoidance-orientated motives are related to poorer eating styles in female college athletes.

Methods:

Participants were 58 female competitive college athletes (field hockey 36%, soccer 41%, volleyball 23%) 18 to 22 years of age ($M_{age} = 19.2$; $SD = 1.2$). Mastery-approach achievement (MAp), Mastery-avoidance (MAv), Performance-approach (Pap) and Performance-avoidance (PAv) goals were assessed with the 2×2 Achievement Goal Questionnaire for Sport (AGQ-S). The Performance Failure Appraisal Inventory - short form was used to measure fear of failure (FF). Eating styles were measured using Emotional Eating Scale (EES; 26 items) and Dutch Eating Behavior Questionnaire (DEBQ; 33 items) with subscales: Emotional (EmE), external (ExE) and restrictive (RE).

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Results:

Age, class status, BMI, and approach-oriented goals (MAp and PAp) were not correlated with eating styles. EmE was significantly predicted by FF ($\beta=.30$, $p=.02$), MAv ($\beta=.26$, $p<0.05$) and self-reported weight ($\beta=.26$, $p<.05$; $F(3,50)=6.44$, $p<.01$, $R^2=.28$). ExE was significantly predicted by PAv ($\beta=.28$, $p<.05$; $F(1,54)=4.40$, $p<.05$; $R^2=.06$). RE was significantly predicted by FF ($\beta=.41$, $p<.01$; $F(1,53)=10.64$, $p<.01$; $R^2=.15$).

Conclusions:

Female college athletes who adopt avoidance orientations have less healthy eating styles. Awareness of and possible interventions for poor eating styles and goal-setting needs to be explored for female college-age athletes.

P251

Psychosocial and environmental correlates of physical activity domains during the transition out of high school

Authors:

Javier Molina-García, Ana Queral, Isabel Castillo, James Sallis

Purpose:

The study purposes were to analyze changes in physical activity domains during the transition out of high school and psychosocial and environmental correlates of these changes.

Methods:

A one-year follow-up study was designed. The baseline sample was composed of 244 last-year high school students (58.6% female). First data collection was performed in the final year of high school. Follow-up rate was 45%. Physical activity was measured by the Global Physical Activity Questionnaire.

Results:

Total physical activity decreased by 21% in males ($P=0.01$) and did not change in females. Active commuting (AC) decreased by 36%, only in males ($P<0.001$). At time 1, access to car/motorbike for personal use, planning/psychosocial barriers, street connectivity and parental education were significantly associated with AC ($P<0.05$). Prospectively, the increase in distance to school/workplace was associated with AC decrease, only in males ($P<0.01$). In both genders, there was a decrease in leisure-time physical activity (LTPA; -35% in males, -43% in females) ($P<0.05$). At time 1, self-efficacy and social support (family and friends) were positive correlates of LTPA ($P<0.05$). Social support decreases were associated with reductions in LTPA for males and females ($P<0.05$). In both genders, work-related physical activity (WRPA) increased dramatically ($P<0.05$).

Conclusions:

LTPA decreased and WRPA increased for females and males. AC decreased only for males. Both psychological and environmental variables were significant correlates of physical activity. Present findings provide an empirical basis for interventions to increase physical activity during transition out of high school.

P252

Is food addiction evident in the Australian youth population and is it related to sex or weight status?

Authors:

Kirrilly Pursey, Tracy Burrows, Peter Stanwell, Clare Collins

Purpose:

While no definition exists for food addiction (FA), the suggestion that an addiction to specific foods could be a contributing factor to obesity is gaining support. It has been postulated that specific food-related characteristics may resemble diagnostic criteria for substance dependence; however, the existence of FA in humans is not yet well explored. This study aimed to determine if FA exists in young Australian adults (18-35yrs) and whether this is related to sex or weight status.

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Methods:

An online survey was developed and included: Demographics, self-reported anthropometric data and the Yale Food Addiction Scale (YFAS). The YFAS assesses seven 'symptoms' associated with FA and allocates a diagnosis of food addiction (≥ 3 symptoms plus meeting clinical impairment criteria). Participants were recruited via social networking sites from March-May 2013.

Results:

504 respondents (84.5% female, mean age=25.1 \pm 4.1 years, mean BMI=23.3 \pm 4.5 kg/m², 73% healthy-weight) completed the survey. 6.2% participants (n=32) met diagnostic criteria for FA (3.9% males and 6.7% females). The most common symptom reported across all participants was the persistent desire for food (91.7%). No differences were found in number of YFAS symptoms reported by sex ($p>0.05$). However, a moderate yet significant positive relationship was found between BMI and number of YFAS symptoms ($r=0.31$, $p<0.05$). When controlling for age, sex and socioeconomic status, BMI was the only significant predictor of number of YFAS symptoms reported.

Conclusions:

The number of FA symptoms reported was positively related to BMI but not to sex. Future studies are required to identify relationships between potential FA and specific foods.

P253

The relationship between sleep problems and dietary choices among college undergraduates

Authors:

Vanessa Errisuriz, Sara Champlin, Keryn Pasch

Purpose:

To examine the relationship between reported sleep problems and dietary choices in a young adult population.

Methods:

Participants were 821 college undergraduates (mean age=18.98; 50.5% White; 58% Female). Students reported frequency (0 to 7 days) of sleep problems over the past week with responses to five items (e.g. "In the past 7 days, how often have you had an extremely hard time falling asleep?") which were summed to create a sleep problems index, with greater values indicating higher sleep problem frequency. Students reported how many times (never to 4 or more times/day) within the past week they consumed various foods and beverages. Linear regression analyses were run, controlling for gender, age, BMI, ethnicity, and perceived stress.

Results:

Sleep problem frequency was significantly, positively associated with amount of energy drinks ($\beta=.02$; $p<.001$), salty snacks ($\beta=.022$; $p=.01$), sweet snacks ($\beta=.025$; $p=.006$), and fast food ($\beta=.031$; $p<.001$) consumed over the past week. Sleep problems were significantly, negatively associated with amount of water ($\beta=-.034$; $p=.005$), fruit ($\beta=-.169$; $p=.004$), and vegetables ($\beta=-.169$; $p=.008$) consumed over the past week.

Conclusions:

Results suggest that, over and above stress, sleep problems are associated with unhealthy dietary choices among college-age youth. It is possible that college youth turn to energy-dense foods and caffeinated beverages for quick energy due to lack of sleep and limited energy to prepare healthier options. Difficulty sleeping is a prevalent health issue among college students, and further research is needed to better understand the mechanisms for the association between sleep problems and dietary behaviors.

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P254

Healthy Active Living: A residence community-based intervention to increase physical activity and healthy eating during the transition to first-year university

Authors:

Denver M. Y. Brown, Steven R. Bray, Matthew W. Y. Kwan

Purpose:

To examine the effect of a Healthy Active Living (HAL) community intervention on moderate-to-vigorous physical activity (MVPA), fruit and vegetable consumption (FVC), and psychosocial mediators of MVPA for students transitioning into university.

Methods:

Freshman undergraduate students residing in either the HAL community (n = 29) or a no-treatment control (n = 32) residence, completed questionnaire measures of MVPA, FVC, outcome expectations and action planning at the beginning and end of the academic year. The peer-delivered HAL community intervention provided students with systematic exposure to organized and facilitated activities and seminars related to behavioral nutrition, physical activity, coping with stress, as well as fostering social integration among the students on the residence floor and within the larger university community.

Results:

Students in the HAL and control groups were equivalent for all variables at baseline. At follow-up, students living in the HAL community reported significantly greater action planning ($F(1, 59) = 3.84, p = .05, d = .50$) and MVPA ($F(1, 59) = 7.74, p < .01$; Cohen's $d = 1.16$) compared to controls. Participants in the HAL community also showed a trend towards greater FVC ($F(1, 59) = 1.91, p = .17; d = .35$), but no differences in outcome expectations ($p > .50$). Action planning for MVPA partially mediated the relationship between the intervention and MVPA (95% C.I. = 0.031 - 2.69).

Conclusions:

A healthy lifestyle community intervention targeting first-year university students was effective in preserving FVC as well as increasing MVPA and MVPA-related cognitions during students' transition into university life.

P255

Weight and health behavior related correlates of academic performance in first year university students

Authors:

Tom Deliens, Benedicte Deforche, Ilse De Bourdeaudhuij, Peter Clarys

Purpose:

This study aimed to examine differences in socio-demographics and health behavior between Belgian first year university students who attended all final course exams and those who did not, as well as to identify weight and health behavior related correlates of academic performance in those students who attended all course exams.

Methods:

Anthropometrics of 101 first year university students were measured at both the beginning of the first (T1) and second (T2) semester of the academic year. An online health behavior questionnaire was filled out at T2. As a measure of academic performance student end-of-year Grade Point Averages (GPA) were obtained from the university's registration office.

Results:

Students who did not attend all course exams were predominantly male, achieved lower GPA's in the last year of secondary school, showed higher increases in waist circumference during the first semester and consumed more French fries than those who attended all final course exams. Being male, lower secondary school grades, increases in weight, Body Mass Index and waist circumference over the first semester, more gaming on weekdays, being on a diet, eating at the student restaurant more frequently, higher soda and French fries consumption, and higher frequency of alcohol use predicted lower GPA's in first year university students.

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Conclusions:

This study shows associations between a wide range of weight and health related behaviors and academic performance in first year university students. Future studies should investigate whether interventions aiming at promoting healthy behaviors among students could also have a positive impact on academic performance.

P256

The role of basic needs satisfaction in the prediction of university students exercise behavior and well-being

Author:

Linus Jonsson

Purpose:

Despite the growing body of research supporting the positive effects of exercise on both psychological and physiological well-being, most people do not engage in regular exercise. Grounded in Self-Determination Theory, the purpose of this study was to examine relationships between basic needs satisfaction, self-efficacy, motivation, exercise behavior and well-being among Swedish university students.

Methods:

A set of instruments measuring basic needs satisfaction, barrier self-efficacy, motivation, well-being, and exercise behaviors was distributed at a university in southern Sweden. The respondents (n=260) were men (n=122) and women (n=138) with a mean age of 22. To analyze and process the gathered data, SPSS was used with Pearson's r and Multiple Regression Analysis.

Results:

The results showed that competence, autonomy and relatedness were positive predictors of self-determined motivation. Identified regulation, intrinsic regulation and barrier self-efficacy were positive predictors for strenuous exercise. Moreover, positive correlations between all the basic needs, strenuous exercise and well-being were shown. No significant correlations between light or moderate exercise and the independent variables appeared.

Conclusions:

This study provides further support for Self-Determination Theory and Self-Efficacy Theory. To promote strenuous exercise and well-being among Swedish university students it appears important to create a need supportive exercise environment, where the basic needs can be satisfied.

P257

Barriers to physical activity among Colombian college students: A cross-sectional study

Authors:

Fernando Rubio, Robinson Ramírez-Vélez, Yisel Carolina Estrada, Katherine González-Ruiz, José Francisco Meneses-Echavez, Jorge Enrique Correa

Purpose:

The aim of this study was to analyse barriers to physical activity (PA) in college students, allowing comparisons between men and women.

Methods:

4,803 college students with a median age of 20 ± 2.6 (range 17-30) years (61.3% female) were evaluated. Participants who stated that they did not get enough PA were surveyed with respect to barriers to PA. The Barriers to Being Active Quiz is a 21-item scale that provides a measure of 7 self-reported barriers to being physically active. In this instrument, the 7 perceived barrier categories are lack of time, social influences, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources. Barriers were analysed for all respondents, as well as by sex and age group for cases with complete data. Multivariate logistic regression analysis was performed to evaluate differences between sexes group. The level of significance ($p < 0.05$) was adjusted for multiple testing according to Bonferroni ($p < 0.01$).

Results:

The three most frequently cited barriers were fear of injury (89.5%), lack of skills (82.1%), and lack of resources

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(66.1%). Lack of energy (35.4% vs. 47.7%), and lack of willpower (45.5% vs. 58.3%) were more frequently stated by female respondents than male respondents. These differences between men and women were significant ($p=0.003$; $p<0.001$) after adjustment for respondents' sex.

Conclusions:

The present study provides relevant data on barriers to PA in college students. By revealing appreciable differences between men and women, this study has implications for efforts to increase college student's PA.

P258

Fit Minded college edition: Feasibility of a magazine-based discussion group on physical activity in female college freshmen

Authors:

Katelyn Pellitteri, Jennifer Huberty, Diane Ehlers, Meg Bruening

Purpose:

Fewer than 50% of female college freshmen meet physical activity (PA) guidelines. Innovative approaches that help college women increase their PA are warranted. The study purpose was to explore the feasibility of a magazine-based discussion group for improving PA, self-worth, and nutrition behaviors in female college freshmen.

Methods:

Twenty-seven women (18-19 years) were randomized to intervention ($n=15$) and control ($n=12$) groups. The intervention group completed an 8-week magazine-based discussion group adapted from a previously tested social cognitive theory based intervention, Fit Minded. Excerpts from a popular women's health magazine were discussed during weekly meetings incorporating PA, self-worth and nutrition education. The control group did not attend meetings, but received the magazines. Outcomes and feasibility measures included: Self-reported PA, self-efficacy, self-objectification, self-worth, social support, fruits, vegetables, junk food and sugary drinks consumed per day.

Results:

Fourteen participants within the intervention group attended >75% of meetings. A time effect was observed for PA ($p=0.007$) and family social support ($p=0.003$). Time x group effects were observed for PA ($p=0.001$), knowledge self-worth ($p=.029$), and sugary drink consumption ($p=0.033$), with the intervention group reporting greater increases in PA and knowledge self-worth and greater decreases in sugary drinks consumed per day. Although not significant, the intervention group demonstrated positive trends in self-efficacy, general self-worth, and friend social support as compared to the control group.

Conclusions:

A magazine-based discussion group may provide a promising platform to improve PA and nutrition behaviors in female college freshmen.

P259

Perceived versus assessed physical activity levels in college students

Authors:

Daniela Lopes dos Santos, Cati Reckelberg Azambuja, Kelly Christine Maccarini Pandolfo

Purpose:

To verify and compare the perceived (PPA) and assessed physical activity (APA) levels in college students.

Methods:

Data were obtained from 420 college students of federal public schools of Santa Maria, RS - Brazil. For the determination of their PPA level, the following question was asked: How do you consider your current physical activity level? Four alternatives were offered: Inactive, moderately active, active and vigorously active. For the determination of their APA level, the Baecke Usual Physical Activity Questionnaire was used, which is a Likert type tool that has sixteen items that

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evaluate the physical activity patterns in a period of time. The scores obtained with the questionnaire classified the adolescents in four groups: Inactive (0 - 5 points); moderately active (6 - 11 points); active (12 - 20 points) and vigorously active (21 points or more). For the analysis, done by frequencies and percentages, they were clustered into 2 groups: Inactive/moderately active and active/vigorously active.

Results:

When asked about their PPA level, most of the students (58,81%) considered themselves as active/vigorously active, while only 41,19% of them perceived their physical activity level as inactive/moderately active. However, when their actual physical activity levels were assessed, almost all students (98,6%) were classified as inactive/moderately active.

Conclusions:

It was concluded that the evaluated students presented a wide distortion between their PPA level and their APA level, indicating that this population has a tendency of overestimating their physical activity levels.

P260

Comparing action planning and preparatory planning instructions on changes in fruit intake behavior and planning in a two-week period: A randomized controlled intervention

Authors:

Gert-Jan de Bruijn, Minh Hao Nguyen, Liesbeth van Osch

Purpose:

Action planning (deciding when or where to eat fruit) has been found to promote fruit intake changes, but little is known how these instructions compare to preparatory instructions (e.g. placing fruit at a visible place). Given that most health behavior change requires preparatory actions, understanding the relative effects of preparatory and action planning on behavior change is needed. The present study was designed to test the effects of action planning and preparatory planning instructions on changes in fruit intake behavior and planning, relative to a standard information control group.

Methods:

Data were collected in undergraduate students participating for course credits ($n=178$, 48.7% male, $M_{age}=20.7$), who indicated to be willing to start eating healthier. Baseline information was fruit intake in the previous two weeks and intention to eat a recommended amount of fruit, after which they were randomly allocated to an action planning instruction ($n=59$), a preparatory planning instruction ($n=58$) or a control condition ($n=61$). Two weeks later, fruit intake, action planning, and preparatory planning was assessed.

Results:

There was a small-to-medium effect of condition, $F(2,171)=3.42$, $p=.036$, $\eta^2=.05$ with follow-up tests showing that fruit intake increased in the action planning condition ($M_{difference}=0.39$), but not in the other two conditions ($M_{difference}<-.023$). There was a small but nonsignificant effect of condition on preparatory planning, $F(2,171)=1.51$, $p=.21$, $\eta^2=.03$, with participants in the action planning condition performing more preparatory actions. There were no effects on action planning behaviors.

Conclusions:

Although tentative, results indicated that action planning instructions may automatically initiate preparatory actions.

Adult Nutrition

P261

Theory of planned behavior beliefs and healthy eating behavior among non-parents and first-time parents

Authors:

Rebecca Bassett-Gunter, Ryna Levy-Milne, Patti Jean Naylor, Cecilia Benoit, Darren Warburton, Danielle Symons Downs, Chris Blanchard, Ryan Rhodes

Purpose:

Interventions guided by the theory of planned behavior (TPB) must target and change underlying beliefs in order to ultimately change behavior (Ajzen, 2002). The primary purpose of the current study was to examine the relationship between TPB beliefs and healthy eating behavior (i.e., fruit and vegetable, and fat consumption). The secondary purpose was to explore which beliefs have the greatest association with eating behavior and explore differences in the associations between beliefs and eating behavior between non-parents and first-time parents.

Methods:

Men (n=106) and women (n=109) who were non-parents (n=92) and first-time parents (n=135) completed TPB beliefs questionnaires and three day food records at baseline, 6- and 12-months.

Results:

Control beliefs were correlated with eating behaviour, whereas behavioural and normative beliefs were not associated with eating behaviour. Exploratory analyses suggest control beliefs regarding access (R²change = 0.19, β = .46, $p < .01$), time (R²change = .19, β = .43, $p < .01$), food preference (R²change = .13, β = .36, $p < .01$), and storage and preparation (R²change = 0.09, β = .31, $p < .05$) and have the strongest association with eating behaviour. There were numerous differences in the belief-eating behaviour associations between cohorts, with beliefs regarding time being associated with behaviour regardless of cohort.

Conclusions:

Interventions guided by TPB should target control beliefs to enhance healthy eating among non-parents and parents. Strategies to enhance control beliefs regarding healthy eating despite limited time may be particularly important for facilitating behavior change.

P262

Dietary energy density in Brazil: Results from the first nationwide food consumption survey, 2008-2009

Authors:

Rosangela Pereira, Luana Monteiro, Paulo Rodrigues, Anelise Vasconcelos, Alessandra Dias, Rosely Sichieri

Purpose:

The consumption of high energy-dense foods possibly plays a role in the increased obesity prevalence in Brazil. This study aims to evaluate dietary energy density in Brazil.

Methods:

Data were obtained in the first National Dietary Survey (2008-2009). Food consumption was estimated based on one-day of food record from a probabilistic sample of individuals ≥ 10 years old (n=34,003). Dietary energy density (DED) was estimated as the ratio between total energy intake (kcal) and total amount of food consumed (grams). Beverages were excluded. Statistical analyses considered sample weights and study design effect.

Results:

Mean DED was 1.69 kcal/g (95% CI=1.67; 1.70). Adolescents (1.83 kcal/g) presented higher DED than adults (1.68 kcal/g) and elderly (1.54 kcal/g) [$p < 0.01$]. Non-overweight individuals had higher DED than overweight individuals (1.70 vs. 1.67 kcal/g; $p < 0.01$). On average, DED was higher on weekends than on weekdays (1.79 vs. 1.67 kcal/g; $p < 0.01$).

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There was a decrease in DED with age ($r = -0.20$; $p < 0.01$) and BMI ($r = -0.08$; $p < 0.01$) increasing. Top food groups contributing to DED were pizza ($\beta = 0.10$), hamburger ($\beta = 0.08$), sandwiches ($\beta = 0.07$), and sweets and desserts ($\beta = 0.05$).

Conclusions:

DED is high in Brazil and should be addressed by interventions promoting healthy eating, especially those targeting adolescents.

P263

A study of produce purchasing behavior and how children may affect acculturating adults

Authors:

Christina Olson, Julie Pickrel, Jennifer Sanchez, Iana Castro, Guadalupe Ayala

Purpose:

Latino consumers who are less acculturated (i.e., traditional) may purchase more produce than consumers who are more acculturated (i.e., assimilated or bicultural). The presence of children in the home may influence the speed at which adults acculturate. The goal of this study is to understand how the consumer's level of acculturation and number of children in the home are associated with the produce-purchasing behavior of Latino adults.

Methods:

Data were derived from baseline interviews of 222 Latino grocery store customers. Twelve Latino grocery stores located in San Diego, California, were recruited to participate in an intervention. Data were analyzed with SPSS.

Results:

A 2 (acculturation: Traditional, assimilated/bicultural) \times 3 (children in household: One, two, three or more) ANOVA with percentage of food budget spent on produce per person as the dependent variable revealed a significant acculturation main effect ($F(1, 216) = 8.75$, $p < .01$) and interaction effect ($F(2, 216) = 8.75$, $p < .05$). Traditional Latino consumers spent proportionally more dollars on produce per person than assimilated/bicultural Latino consumers ($M_{\text{traditional}} = 0.35$, $M_{\text{assimilated/bicultural}} = 0.30$). Interaction effects showed that for traditional Latino consumers, having two or more children was significantly associated with spending proportionately less on produce ($M_{\text{traditionalonechild}} = .40$, $M_{\text{traditionaltwochildren}} = .32$, $M_{\text{traditionalthreeormore}} = .34$). No other differences were observed.

Conclusions:

Latinos with children may require unique attention because the percentage of dollars spent on produce per person was significantly less among traditional Latinos with two or more children in the household.

P264

Influence of nutritional labeling on appetite sensations among normal-weight and obese women

Authors:

Elise Carbonneau, Vicky Drapeau, Julie Perron, Benoit Lamarche, Eric Doucet, Sonia Pomerleau, Véronique Provencher

Purpose:

To investigate the impact of nutritional labeling on appetite sensations among women.

Methods:

During a 10-day period, 73 normal-weight (body mass index (BMI) $< 25.5 \text{ kg/m}^2$) and 74 obese women (BMI $\geq 29.5 \text{ kg/m}^2$) consumed three meals per day under ad libitum conditions. Participants were randomly assigned to one of three experimental conditions in which the only difference was the label posted on lunch meal entrée: 1) Nutrient-label (low-fat claim), 2) calorie-label (caloric content of the entrée and average daily needs), and 3) no-label (control). Hunger and satiety sensations were rated on visual analog scales immediately before and after each meal. Satiety signal efficiency was assessed through the calculation of the satiety quotient (SQ).

Results:

Among normal-weight women, no difference was observed at lunch between nutrient-label, calorie-label and no-label conditions for SQ for hunger ($12.8 \pm 4.6 \text{ mm}/100 \text{ kcal}$, $11.7 \pm 5.1 \text{ mm}/100 \text{ kcal}$, and $12.6 \pm 5.7 \text{ mm}/100 \text{ kcal}$, respectively; $p=0.43$) and SQ for satiety ($10.8 \pm 5.1 \text{ mm}/100 \text{ kcal}$, $10.5 \pm 5.4 \text{ mm}/100 \text{ kcal}$, and $11.7 \pm 6.1 \text{ mm}/100 \text{ kcal}$, respectively; $p=0.55$). Among obese women the nutrient-label vs. the calorie-label was associated with higher SQ for hunger ($11.7 \pm 4.7 \text{ mm}/100 \text{ kcal}$ and $9.1 \pm 4.5 \text{ mm}/100 \text{ kcal}$, respectively; $p=0.008$) and SQ for satiety ($10.8 \pm 5.2 \text{ mm}/100 \text{ kcal}$ and $8.1 \pm 4.9 \text{ mm}/100 \text{ kcal}$, respectively; $p=0.0797$). The two conditions showed no difference vs. the no-label condition.

Conclusions:

Lunch meals with a nutrient label were rated as being more satiating than lunch meals with a calorie label among obese women, whereas no difference was observed between conditions in normal-weight women. Those findings suggest that obese women may be more influenced by external factors such as nutritional labeling and eat less intuitively than normal-weight women.

P265

Impact of nutritional labeling on calorie intake in normal-weight and obese women

Authors:

Julie Perron, Benoît Lamarche, Élise Carbonneau, Vicky Drapeau, Éric Doucet, Sonia Pomerleau, Véronique Provencher

Purpose:

To assess the impact of nutrient-content claims and calorie posting on caloric intake among normal-weight and obese women during a 10-day period.

Methods:

Participants ($n=146$) received an ad libitum menu during 10 consecutive days, and were told to eat only foods provided in the study. Normal-weight ($n=72$) and obese ($n=74$) women were randomly assigned to one of the three conditions: (1) Nutrient-content claim condition ($n=46$), in which a label indicated that the lunch meal entrée was low in fat and trans fat free; (2) Calorie condition ($n=52$), in which a label indicated the calorie content for a specified serving of the lunch meal entrée and a recommendation of the daily caloric requirement; (3) Control condition ($n=48$), in which no nutritional information was provided. With the exception of the provided information, the menu was exactly the same for all three conditions. The average caloric intake was calculated by weighing the leftovers.

Results:

No difference was observed for caloric intake for the lunch meal entrée between the three conditions ($403.8 \pm 129.7 \text{ kcal}$, $391.3 \pm 126.4 \text{ kcal}$, and $375.2 \pm 124.3 \text{ kcal}$ for nutrient-content claim, calorie and control conditions, respectively; $p=0.11$). Mean daily caloric intake was not different between groups (nutrient-content claim: $2532.2 \pm 463.7 \text{ kcal}$; calorie: $2539.0 \pm 503.0 \text{ kcal}$; control: $2451.8 \pm 477.4 \text{ kcal}$; $p=0.47$). No main interaction between conditions and BMI categories was observed.

Conclusions:

These results suggest that providing nutritional information does not influence energy intake of women over a 10-day period. In addition, weight status does not seem to affect differently food behaviors in response to nutritional information.

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Relationships between motivational variables, eating behavior traits, psychological characteristics and energy intake

Authors:

Mariève Dupont, Caroline Senécal, Annette Galant, Angelo Tremblay, Émilie Pérusse-Lachance, Vicky Drapeau

Purpose:

Knowledge-based work and exercise have been shown to influence spontaneous energy intake differently for men and women. It is unknown if the motivational variables moderate these relationships. More specifically, does general level of motivation, as defined by the Self-Determination Theory, moderate the relationships between eating behavior traits, psychological variables and ad libitum energy intake and this, differently between exercise and mental work conditions.

Methods:

Twenty-two men and 13 women were recruited to participate in cross-over study that included three conditions a) mental task (reading a document and writing a summary of 350 words), b) physical activity (walking on a treadmill at 40% of VO₂ peak), and c) control (rest in seated position). Conditions lasted 45 minutes and were followed by an ad libitum buffet-type meal where energy intake was measured. Questionnaires were administered at baseline to evaluate motivation variables (Global Motivation Scale), eating behavior traits and psychological characteristics. Pearson's correlation, repeated measures ANOVA and regression analyses were performed.

Results:

Controlled motivations were associated with rigid ($r=0.39$, $p=0.02$), flexible control of eating ($r=0.39$, $p=0.02$), disinhibition ($r=0.34$, $p=0.05$), anxiety ($r=0.38$, $p=0.03$) and depression symptoms ($r=0.43$, $p=0.01$). Autonomous motivations were associated with mental toughness ($r=0.67$, $p<0.01$). None of the motivation categories moderated the relationships between eating behavior traits, psychological variables and absolute or relative energy intake.

Conclusions:

Despite significant relationships between motivational variables and eating behavior traits and psychological measures, motivational profiles do not moderate the relationships between these measures and ad libitum energy intake.

P267

Simple Cooking with Heart: Culinary skill-based education improves diet quality and nutrition literacy

Authors:

Liz McKnight, Dorothea Vafiadis, Kimberly Stitzel, Natasha Doolittle

Purpose:

Meals eaten away from home, tend to have more calories, saturated and trans fats, and sodium and fewer fruits, vegetables, and whole grains than meals prepared at home, contributing to higher body mass indexes. The American Heart Association's Simple Cooking with Heart program objective is to test whether increased consumption of home-prepared meals improves the diet quality of Americans. The program is based on the Social Cognitive Theory of behavior change.

Methods:

Culinary skill-building based nutrition education that provides tools, recipes, instruction for preparing low-cost, heart healthy meals was administered to low-income families. The program includes experiential skill acquisition through "live" cooking demonstrations and a robust program website which includes tools, low cost recipes and instructional videos. A third party evaluation measured program impact on skill acquisition, attitudinal change, intent, and consumption changes.

Results:

Participation in "live" cooking demonstrations was associated with positive attitudinal change and was effective in improving knowledge and skills. The program website and materials are effective interventions to improve culinary skill, attitudinal change, efficacy/confidence, and increase frequency of home prepared meals. An increase in fruits, vegetables and whole grains consumption was also observed. Participants of a 30-day online focus group experienced positive

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gains regarding: Raised awareness and outcome expectations, and increases in efficacy and skill acquisition: Increased confidence, skills and techniques to prepare meals at home (participants identified higher at 30 days for behavioral capacity, self-efficacy, intentions, and outcome expectations.)

Conclusions:

Using culinary skill development programs is associated with improving diet quality and improving nutrition literacy.

P268

Assessment of program implementation for the Mississippi Communities for Healthy Living (MCHL) nutrition intervention

Authors:

Holly Huye, Alicia Landry, Martha Resavy, LaShaundrea Crook, Carol Connell

Purpose:

To assess program implementation (PI) using an implementation score composed of process evaluation (PE) components reach, dose delivered, dose received and fidelity.

Methods:

This 9-month, multi-site nutrition intervention consisted of two treatment groups (N=319). Sixteen sites in 11 counties of Mississippi met monthly for five nutrition education sessions and one review session delivered by three educators indigenous to the area. Educators were provided extensive training related to lessons and the theoretical foundation prior to and midway through the intervention. The implementation score was derived from attendance records, participant evaluations, educator fidelity evaluations, and educator self-reports that were maintained for each session. These measures composed the four PE component scores that were averaged to obtain a PI score; an a priori PI score of 80% was set as a target to indicate acceptable implementation.

Results:

The overall PI score was 88% with 74% (n=236) of the participants reached, averaging three (M=3.2) out of five sessions attended. Dose delivered was scored at 99% (n=235) while dose received was scored at 93% (n=235) and fidelity at 82% (n=223).

Conclusions:

Process evaluation allows researchers to identify factors that contribute to the success or failure of multi-site interventions with significant distance between research staff and sites. While extensive educator training and feedback may have resulted in a higher PI score, educator bias related to dose delivered measures may have contributed to elevated scores. Furthermore, data analysis methods for multiple data sources used for several sessions with multiple sites should be pilot tested.

P269

Do demographic and health literacy characteristics matter when using the theory of planned behavior to understand sugar-sweetened beverage intake?

Authors:

Valisa Hedrick, Paul Estabrooks, Yvonne Chen, Maja Tyhurst, Kathleen Porter, Jamie Zoellner

Purpose:

Several studies have explored demographic variance in the Theory of Planned Behavior (TPB) constructs for health promotion behaviors, such as physical activity and fruit and vegetable intake, yet none exist for sugar-sweetened beverage (SSB) intake. Developing effective theory-based interventions targeting SSB intake demands understanding how demographic and theoretical constructs may interrelate to influence SSB behaviors. This study explored: 1) Whether TPB explained significant variance in SSB intake, and 2) differences in TPB constructs by gender, age (<50, >50 yrs), income (<\$25,000, >\$25,000), BMI (<30, >30 kg/m²), and health literacy status (high, low).

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Methods:

Using cross-sectional baseline data of an on-going RCT targeting SSB behaviors, developed using the TPB, adults (n=222) completed validated instruments/assessments of beverage intake, BMI, demographics, and SSB TPB-related questions. Statistical analyses included descriptives, MLR, and ANOVAs.

Results:

Participants (81% F, 40.8±14 yrs; BMI=32.45±9 kg/m²) had an average SSB consumption of 436±344 kcals/day. The TPB model moderately explained SSB intake (R²=0.22; F=14.86, P<0.0001). Adults >50 years demonstrated more positive attitudes, perceived behavioral control (PBC), and intentions towards reducing SSB (mean difference=0.30, 0.55, 0.60, P<0.05, respectively). Those with income >\$25,000 demonstrated higher PBC and intentions towards reducing SSB (mean difference=0.46, 0.55, P<0.05, respectively). No significant differences were found between gender, health literacy, or BMI groups, with the exception of obese participants demonstrating more positive subjective norms (mean difference=0.49, P<0.01).

Conclusions:

The TPB is a viable theoretical framework when examining SSB behaviors. TPB construct variance by age and income level should be explored in future longitudinal examinations.

P270

The effect of breakfast size prior to morning exercise on cognition, mood and appetite in habitually active females

Authors:

Rachel Veasey, Crystal Haskell-Ramsey, David Kennedy, Brian Tiplady, Emma Stevenson

Purpose:

Advantageous pre-exercise nutritional practices for individuals who exercise for cognitive, mood and appetite benefits, rather than to improve physical performance, have not been well established. This study aimed to assess the effect of breakfast prior to exercise on cognition, mood and appetite in habitually active females.

Methods:

Active females (N=24, aged 20.9 ± 2.3 y) completed 3 trials in a randomised, cross-over design. Baseline cognitive tasks (FCRT, Stroop, NBack and RVIP) and mood and appetite VAS were completed at 0815 h. Participants then consumed a cereal breakfast (providing 118 or 236 kcal) or no breakfast. After 45 min rest, they completed a 30 min run at approx. 65% HRR. Cognition, mood and appetite were re-assessed immediately post-exercise, hourly until lunch and immediately post-lunch. Participants then left the lab but completed cognitive tasks (Arrow RT, NBack and RVIP) and mood and appetite VAS (via a mobile phone) at 1500 and 1900 h. Data was analysed as change from baseline using ANOVA.

Results:

Until at least 5 h post-exercise, both breakfasts improved mental fatigue and overall mood ratings. The larger breakfast led to poorer working memory and RVIP performance at 1500 h. Breakfast was beneficial for appetite ratings at every time point up until post-lunch.

Conclusions:

These data provide information on the appropriate pre-exercise nutritional practices for an active female population who exercise for cognitive, mood and appetite benefits. A small breakfast consumed prior to exercise can improve post-exercise mood and appetite control, without the cognitive decline associated with consuming a larger breakfast.

P272

Does buffet space management affect intake? A choice architectural intervention on butter intake at a breakfast buffet

Author:

Bent Egberg Mikkelsen

Purpose:

The idea that automaticity and non-rational processes influences food choice is increasingly under investigation in the study of human dietary behavior. Behavioral change has traditionally been assuming informed, rational and reflexive

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decision making. However insight from new marketing research has increasingly been focusing on the role of non reflexive, non informed and embodied pathways. To explore whether altering the architecture of buffets had any effect on intake.

Methods:

300 students were invited to a traditional Danish breakfast buffet. Students were split into two. A nudge were introduced in the one half and no nudge in the other. The nudge consisted of moving the butter to a less visible position at one side of the buffet, a position from where the guest would have to ask for the butter. At the other end of the table the butter was fully visible and accessible. In both cases the butter was served in single portion packs.

Results:

The results showed that introducing the nudge decreased the uptake of butter in the form of single portion packs of butter.

Conclusions:

The findings suggest that accessibility and visibility of food play an important role in food choice in self service catering environments.

P273

Beyond hunger: Unlocking the events that prompt Americans to eat

Author:

Marcia Greenblum

Purpose:

To describe how frequency and characteristics of traditional meal and non-meal occasions vary by age, gender, presence of children and BMI.

Methods:

A cross-sectional survey was administered to a national demographically-balanced sample of 2702 adults 18-80 years old via an online market research panel. Survey respondents had consumed any food or beverage either at home or away from home the previous day, totaling 6689 eating/drinking occasions. Outcome measures include eating occasion characteristics and goals by age, gender, presence of children and BMI.

Results:

Older respondents were more likely to report planning traditional meal occasions and report on a breakfast occasion than younger respondents. Two prominent consumption occasion triggers were habit and hunger/thirst with one dominant benefit of satisfying hunger/thirst. Habit and nutrition were more prominent goals for eating occasions for older compared to younger respondents. When children were present in the household, respondents had a goal of connecting with "family, friends or colleagues" at dinner compared to those without children. BMI levels were related to a range of triggers, goals and behaviors, but not as prominently as relationships observed with age. Those with BMIs >30 were less health conscious regarding dinner and breakfast consumption compared to those with lower BMIs.

Conclusions:

Among demographic variables, age differences were noted in relation to advance planning and eating occasion triggers and goals more often than other demographic characteristics or BMI. Understanding these differences can be beneficial in tailoring promotion of healthful intake within specific eating occasions for particular subgroups of the population.

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P274

Identification of perceived barriers to obtaining and consuming fruits and vegetable sub-groups and notable group differences: Comparisons using linear discriminant function analysis

Authors:

Jennifer Sanchez, Julie Pickrel, Iana Castro, Christina Olson, Guadalupe Ayala

Purpose:

Lack of access to healthy foods disproportionately impacts racially/ethnically diverse, low-income populations, such as Latinos, and contributes to disparities in obesity. Understanding differences between individuals reporting low versus high perceived barriers to obtaining and consuming produce is needed for the development of targeted nutrition interventions.

Methods:

Data were obtained from baseline interviews conducted with 278 Latino store customers recruited to serve on the evaluation cohort of a store-based intervention. Twelve small stores located in San Diego County, California were randomly sampled from an enumerated list and recruited to participate. Customers were recruited while entering the store and in-person interviews were conducted onsite or at another location. Seven predictor variables were used to determine low or high perceived barriers group membership. A discriminant function analysis was performed to determine membership in the low perceived barriers group or the high perceived barriers group. Data were analyzed using R.

Results:

Box's M test for the homogeneity of covariance matrices assumption was insignificant ($p=.187$). One linear discriminant function was tested and was significant ($p=.002$). The weights and loadings of the standardized discriminant function coefficients identified five significant predictors. Individuals in the low versus high perceived barriers group reported higher incomes, were less likely to be food insecure, purchased produce more frequently, reported households with more children and yet also reported spending less money on groceries each week.

Conclusions:

This study demonstrated the existence of two nutrition-related subgroups, and factors associated with these subgroups, both of which are relevant for future targeted interventions.

P275

Comparison of Canadian adults salient beliefs regarding milk and cheese consumption: A qualitative study based on TPB

Authors:

Marie-Josée Lacroix, Sophie Desroches, Mylène Turcotte, Geneviève Painchaud Guérard, Paul Paquin, François Couture, Véronique Provencher

Purpose:

To compare Canadian adults salient beliefs underlying the consumption (or not) of specific dairy products (fluid milk and cheese) previously identified using the Theory of Planned Behavior.

Methods:

Healthy men and women (19 to 50 years-old) were recruited to participate in focus groups ($n=161$ participants; $n=20$ focus groups). All groups were led by a trained moderator using a standardized semi-structured interview guide that aim to elicit participants' salient beliefs regarding attitudes (behavioral beliefs), subjective norms (normative beliefs), and perceived behavioral control (control beliefs). A thematic content analysis of transcribed discussions was performed using the three first steps of the grounded theory analysis to bring out differences in beliefs between milk and cheese.

Results:

Perceived as a basic food, milk is more associated with children and consumed for cognitive reasons according to beliefs reported. Drinking milk as an adult is a behavior that also raises more questions, i.e. more discomfort, concerns and even disgust than eating cheese. Less perceived as a basic food than milk, cheese is more expensive, convenient,

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versatile, less perishable and more associated with pleasure. According to participants, the diversity of products currently available in the food supply can facilitate the consumption of cheese. Finally, consumption of milk causes different health effects than cheese consumption.

Conclusions:

These findings underline important beliefs differences to explain social and behavioral factors associated with the consumption of fluid milk and cheese, which will be helpful to optimize different strategies for the promotion of these two dairy products.

P276

Building the capacity among food and nutrition community in Iran and its expansion to the Middle East: Leadership development initiatives

Authors:

Azadeh Davari, Arash Rashidi, Ted Baartmans

Purpose:

This paper presents our endeavors started in 2007 to develop leadership training programs for food and nutrition specialists in Iran and the Middle-east region.

Methods:

We did quantitative and qualitative studies to find out the most limiting leadership skills among food specialists in Iran. Observational visits were also made to two similar programs in Europe and South-East Asia as best practices. With internal and external consultation, we made advocacy and developed an initial 4-day training workshop based on transformational leadership framework for food and nutrition young talents (The Iranian Food and Nutrition Leadership Program - IFNLP). Visionary leadership, creativity, effective communication complemented by coaching and outbound sessions were the main program components. These elements have already been expanded to the region, young nutrition alumni, and PhD students in selected nutrition departments.

Results:

The first workshop was held in 2009 in Tehran. Program successfully expanded to the region in 2012 with the World Health Organization regional nutrition officers as participants. Other initiatives for PhD students and nutrition alumni were made available between 2011-13. All workshops received very positive feedback for participants.

Conclusions:

While all undergraduate and graduate nutrition programs at Iranian Universities deal with technical issues, professional success of alumni depends very much on some general skills. Our leadership development initiatives have targetted these skills and could show promising results among the participants. We highly suggest that such general capacity building endeavors become available through present academic curricular programs as well as continuing education in the country and the region.

P277

Preliminary study of eating behavior screening in Moroccan population

Authors:

Fatima-Zahra Azzaoui, N Sekkat, A Ahami, H Hami

Purpose:

Nervosa bulimia and nervosa anorexia are the most common specific forms of eating disorders in all over the world. Early detection and treatment improve the prognosis and could reduce their consequences. The objective of this study is to detect the presence of these eating behaviors in the studied population.

Methods:

This preliminary cross-sectional study is realized among 115 adolescent and adult patients in a health center of Rabat, Morocco. It is conducted through the measurement of weight and height, which serves for the determination of the body mass index (BMI), and by using the SCOFF questionnaire for screening of eating disorders.

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Results:

The results show that 52.69% of the studied patients suffer from eating disorders, with 53.25% among women and 47.83% among men. The BMI scores show that 2.94% are underweight, 36.26% are normal weight, 37.25% are overweight and 23.53% are obese.

Conclusions:

These results show a presence of an important percentage of eating disorders. So, deeper investigations are needed to more study this health problem in Moroccan population.

P278

U.S. trends in adult reported utilization and helpfulness of menu labeling in restaurants

Authors:

April Oh, Anh Nguyen, Heather Patrick

Purpose:

Menu labeling legislation is a policy lever that may be used to promote healthy eating and reduce or maintain healthy weight. This examination of US adults identifies subpopulations more likely to use menu labeling information, specifically examining demographic, behavioral and health-related conditions and which populations find menu labeling helpful when making decisions about what to order.

Methods:

Using the 2012 National Cancer Institute's Health Information National Trends Survey, weighted logistic and linear regression models were conducted to examine whether health confidence, daily fruit and vegetable intake, attempted behavioral change/maintenance items, and medical conditions were associated with use of menu information and perceived helpfulness of menu information while adjusting for selected covariates.

Results:

Results indicate that in US adults, those who intended to lose weight (OR=5.01 (2.94,8.46)), vegetable intake (OR=2.25 (1.32, 3.83)) or reduce soda consumption (OR= 1.67 (1.11, 2.51)) were more likely to report using menu labeling information when available. More women reported calorie information was helpful when ordering ($p<0.05$). Disparities by race/ethnicity and SES were identified in use and helpfulness.

Conclusions:

Findings highlight potential subgroups to target for communication and education efforts regarding use of calorie information in restaurants. Further surveillance of public behavioral response to US menu labeling legislation may be important to inform message framing and evolution of educational interventions to promote use of calorie information on menu boards.

P279

Grocery shopping behaviors and F&V consumption among Latinos in San Diego, CA, USA

Authors:

Julie Pickrel, Iana Castro, Jennifer Sanchez, Barbara Baquero, Christina Olson, Guadalupe Ayala

Purpose:

This study aims to examine the relationship between shopping frequency and percentage of grocery dollars per person spent on fruits and vegetables (FV) and daily FV intake.

Methods:

Baseline in-person interviews were conducted with 272 Latino store customers (in English or Spanish), who were recruited while entering a store to serve in the evaluation cohort of a store-based intervention. Twelve stores located in San Diego County, California, USA were recruited to participate from an enumerated list of eligible stores. FV intake was assessed using the National Cancer Institute's FV screener. Descriptive statistics and regression analyses were conducted using SPSS.

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Results:

A regression analysis examining the relationship between daily FV intake and two predictors, percentage of grocery dollars per person spent on FV and frequency of shopping for FV, found that both were positively correlated with FV intake (both $p < .01$). A one-way (weekly shopping frequency: Less than 1 time, 1 to 2 times, more than 2 times) ANOVA with daily FV intake as the dependent variable showed that an increase in weekly shopping frequency from less than 1 time per week to 1 to 2 times was associated with a significant increase in intake of over 2/3 cup ($t(215) = -2.86$, $M_{\text{less than 1 time}} = 1.04$, $M_{1\text{ to }2\text{ times}} = 1.73$).

Conclusions:

Results suggest that intervening to promote FV consumption at the point of purchase is valuable given that those who visit stores more often and spend proportionally more on fresh produce are more likely to have a higher intake.

P280

Fast food consumption, diet quality, and body weight: Cross-sectional and prospective associations in a community sample of working adults

Authors:

Timothy Barnes, Simone French, Nathan Mitchell, Julian Wolfson

Purpose:

Fast food (FF) consumption has increased in frequency over the past few decades and has been linked cross-sectionally with higher energy intake, poor diet, and higher body weight. However, few studies have examined whether change in FF consumption is associated with changes in diet and body weight over time. It is hypothesized that a reduction in FF consumption could be linked to improved diet quality and lower BMI.

Methods:

Data from 200 participants in a worksite nutrition intervention were used to examine the association between FF consumption and diet quality using the 2010 Healthy Eating Index (HEI-2010), selected nutrients, and BMI. General linear and longitudinal mixed models were used to examine cross-sectional and prospective associations between FF consumption, diet quality and BMI, adjusting for demographic covariates.

Results:

Cross-sectionally, frequency of FF consumption was significantly positively associated with daily total energy intake ($\beta=62.7, p=0.03$), negatively associated with the overall HEI-2010 score ($\beta=-1.14, p=0.04$), total vegetables ($\beta=-0.17, p=0.004$), whole grains ($\beta=-0.30, p=0.04$), and empty calories ($\beta=-0.45, p\text{-value}=0.01$), positively associated with percent of calories from fat ($\beta=0.28, p\text{-value}=0.02$), and there was no association observed with BMI ($\beta=0.43, p=0.09$). Over six months, the mean change in frequency of FF consumption was -0.11 times per week and decreases in FF frequency were only significantly associated with increases in total vegetable consumption ($\beta=-0.13, p=0.047$).

Conclusions:

Findings suggest that frequency of FF consumption is significantly associated with higher energy intake and poor diet quality cross-sectionally; however, change in FF consumption was not significant towards diet quality and BMI over a short time period.

P281

Preliminary results of a six-week nutrition education program targeting mothers in a diverse community on family eating habits

Authors:

Adrian Chavez, Sonia Vega-Lopez, Samantha Bustillo, Monica Gutierrez, Noe Crespo

Purpose:

To assess the feasibility of a community-based nutrition education program targeting mothers of children 6-11 years old for improving family eating behaviors.

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Methods:

A 90-minute weekly nutrition education program was delivered at a community center in South Phoenix over the course of six weeks to predominantly Latino (83%) women. Most women reported living below the federal poverty level (89%) and having a history of gestational diabetes (78%). A survey was administered to assess dietary habits of the mothers and their children before and immediately after the six-week program. Twenty mothers with 31 children in the desired age range attended at least one session and completed both pre and post measures.

Results:

Relative to baseline, post-intervention data showed an increase in parent-report use of nutrition labels to make food selections (30% vs. 70%, $p=0.07$). There was an increase in reported consumption of 2-3 daily servings of fruit ($p=0.01$); fewer parents reported usually eating <2-3 servings (40% vs. 10%), whereas more parents reported rarely or never eating <2-3 servings (10% vs. 45%). A higher proportion of parents reported rarely or never eating fried foods after the intervention (25% vs. 55%; $p=0.03$). More parents reported infrequent consumption (< twice per week) of soda (67.7% vs. 41.9%), fruit flavored sugar-sweetened beverages (71% vs. 38.7%), and cake and pastries (80.6% vs. 48.4%) by their children following the intervention (all $p<0.05$).

Conclusions:

A community-based nutrition education intervention targeting mothers of young children from diverse backgrounds achieved modest yet positive improvements in self-reported dietary habits.

P282

Nutrition facts label use, household availability of beverages and participation in SNAP

Authors:

Karina Lora, Lindsay Scott, Paul Branscum, Michael Anderson, Allen Knehans

Purpose:

1) Assess the association between low-income mothers' use of the Nutrition Facts label to purchase beverages and participation in the Supplemental Nutrition Assistance Program (SNAP), and 2) Assess differences in household availability of beverages between label and non-label readers.

Methods:

Cross-sectional study including mothers ($n=250$; 31 ± 11 years) of preschool children. Participants completed a survey with three sections: The first evaluated how often participants use the Nutrition Facts labels to help them with beverage purchases, the second consisted of a Home Beverage Inventory, and the third was demographic data. Multivariate logistic regression models tested the independent effect of SNAP participation on Nutrition Fact label usage while controlling for covariates.

Results:

Two thirds of non-SNAP, while 50% of SNAP participants always/almost always/sometimes used the Nutrition Facts label to purchase beverages and differences were significant ($p\leq 0.05$). SNAP participation was associated with reduced Nutrition Facts label use to purchase beverages ($p=0.05$) after controlling for covariates. Odds of Nutrition Facts label use among non-SNAP participants were almost two times greater than those enrolled in SNAP (aOR=1.88 95%CI=1.00, 3.56). There was no significant difference in household availability of beverages between label and non-label readers. However, SNAP participants had significantly more juice drink, regular soda and low-calorie beverages available in their homes than non-SNAP participants ($p\leq 0.05$).

Conclusions:

SNAP participants do not use the Nutrition Facts label as frequently as non-SNAP participants. Although household availability of beverages did not differ between label and non-readers regardless of SNAP participation, availability of sugar-sweetened beverages is higher in SNAP households.

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Is consumption of foods away from home linked with BMI and diet quality in adults?

Authors:

Rebecca Seguin, Anju Aggarwal, Francoise Vermeulen, Adam Drewnowski

Purpose:

Since the 1970s, consumption of foods away from home (FAFH) has steadily increased. FAFH tend to be more calorically dense, higher in total and saturated fat, and lower in micronutrients compared to home-prepared foods. The purpose of this study was to examine if higher consumption of FAFH was associated with higher body mass index (BMI) and lower fruit and vegetable (FV) intake among adults.

Methods:

The Seattle Obesity Study was a cross sectional study that included a representative sample of 2,001 adults residing in King County, Washington. Data on diet (including consumption of FAFH and FV intake), physical activity, health, and socio-demographic factors were collected throughout 2008-09 using a telephone survey. Frequency of FAFH was categorized as 0-1, 2-4, 5-7, or 8+ times per week. BMI was calculated from self-reported height and weight. FV intake was calculated as servings per day. Gender-stratified, multivariate models were used to examine the relationship between frequency of FAFH and BMI and the relationship between frequency of FAFH and FV consumption.

Results:

The mean (\pm standard deviation) age and BMI of participants was 53.72 (\pm 14.64) and 26.56 (\pm 5.45), respectively. Increased consumption of FAFH was associated with higher BMI, after adjustment for age, income, education, race, smoking, marital status, and physical activity (women: $p=0.001$; men: $p=0.003$). Although results were mixed, the findings suggest a negative association between the consumption of FAFH and FV consumption.

Conclusions:

Among adults, increased consumption of FAFH appears to have a negative impact on BMI and possibly diet quality as well.

P285

Differences in fat and sodium intake across hypertension subgroups in the Mississippi Communities for Healthy Living (MCHL) nutrition intervention

Authors:

Alicia Landry, Samantha Walters, Elaine Molaison, Holly Huye, LaShaundra Crook, Carol Connell

Purpose:

Examine differences between self-reported intakes of sodium, trans-fat, and total fat among hypertension (HTN) subgroups of participants in Mississippi Communities for Healthy Living nutrition education intervention.

Methods:

Dietary intake was measured using a food frequency questionnaire adapted for the Lower Mississippi Delta. Systolic blood pressure (BP) was converted to a categorical variable based on the ATPIII guidelines (normal <120 mmHg, pre-HTN 120-139mmHg, stage I 140-159mmHg, and stage II >160 mmHg). ANOVA was used to test nutrient intake differences between HTN subgroups. LSD post hoc tests were evaluated for within group differences.

Results:

Sodium, trans-fat and total fat intake were significantly different between HTN subgroups ($F(3,260)=2.95$, $p=.033$; $F(3,260)=3.84$, $p=.01$; $F(3,260)=3.01$, $p=.031$, respectively). Participants with Stage 1 and 2 HTN consumed significantly less sodium than participants with normal BP. Individuals with pre-, stage 1 and 2 HTN consumed significantly less trans-fat than those with normal BP ($M=3.71$, $SD=2.34$, $p=.001$; $M=3.79g$, $SD=2.224$, $p=.046$; $M=2.91g$, $SD=2.109$, $p=.004$, respectively). Total fat intake was significantly less in pre-HTN ($M=70.34$, $SD=40.85$, $p=.015$) and stage 2 HTN ($M=61.57g$, $SD=41.73$, $p=.016$) compared to those with normal BP ($M=86.32$, $SD=48.55$).

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Conclusions:

Prior research indicates lifestyle changes may likely occur after HTN diagnosis. Regardless, mean daily intake of sodium and fats were higher than recommended dietary allowances for all groups and mean intakes for stage 2 HTN came closest to recommended amounts. Previous quality/quantity of nutrition education is unknown in this sample but attempting to quantify this may be of benefit for future studies.

P286

The influence of plate size on meal consumption

Authors:

Tamara Bucher, Elena Libotte, Michael Siegrist

Purpose:

It is a common belief that people will consume more food from a larger plate; as a result, influential organizations and dieting programs recommend using smaller plates to control portion sizes. However, our review of studies investigating the influence of serving container size on energy intake revealed controversial results, where the effects largely depended on study design and container type. Furthermore, whether plate size influences meal composition had not yet been investigated. Here, we used a highly controlled experimental setting to assess whether plate size influences meal energy and composition.

Methods:

Eighty-three participants (42 women) were invited to serve an individual lunch from a 'fake food buffet' containing 55 replica food items. Either a standard-sized plate (27 cm in diameter) or a large plate (32 cm in diameter) was provided to each participant. The energy derived from different food categories was compared between conditions.

Results:

The plate size had no significant effect on the total energy of the meal ($F(1,81)=0.782$, $P=.379$, $\eta^2=.010$), but participants in the large plate group served themselves significantly more vegetables ($M=203$ kJ, $SD=97$) compared to participants in the standard-sized plate group ($M=161$ kJ, $SD=74$; $F(1,81)=4.786$, $P=.032$, $\eta^2=.056$). The difference was still significant after controlling for covariates such as preferences, health consciousness, and nutritional knowledge.

Conclusions:

Reducing the plate size does not seem to be an appropriate intervention to promote weight loss. Rather, using a large plate might be a simple and inexpensive strategy to increase vegetable consumption.

P287

Factors influencing food preparation behaviors: Findings from focus groups with Mexican-American mothers in the western U.S.

Authors:

Teresa M. Smith, Genevieve F. Dunton, Courtney A. Pinard, Amy L. Yaroch

Purpose:

Despite prior studies assessing dietary behaviors and related attitudes among U.S. adults, very little is known about food preparation behaviors among parents, specifically ethnic minorities such as Mexican-Americans. The purpose of this study was to explore food preparation behaviors and influencers among Mexican-American mothers.

Methods:

Data were collected through four focus groups with mothers of Mexican origin/ancestry, now living in the U.S., who considered themselves to be the primary food preparer (three focus groups were conducted in English and one Spanish). Data were analyzed using a qualitative grounded theory approach. All focus groups were audio recorded and transcribed verbatim, and coded for themes.

Results:

Of the sample ($N = 21$), 13 were born outside the U.S., mean age was 35 years, and mean household size was 5 mem-

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bers. Respondents reported that food was often prepared using traditional staples (e.g., beans, rice, tortillas, and spices) and food preparation behaviors and skills were learned from maternal family members. Respondents also suggested that health was influenced by foods eaten and how they were prepared. Salient factors influencing food preparation behaviors included family preference and familiarity, culture, and self-efficacy. Time and busy schedules were cited as barriers to food preparation.

Conclusions:

This study provides some preliminary information to help characterize the home food environment among Mexican-American families, underscoring how food preparation in the home can support a healthy diet. Future interventions should consider a family-based approach and consider teaching culturally-relevant food preparation skills, while reinforcing more healthful dietary practices.

P288

Skipping breakfast and its associated factors-differences in motivation for eating breakfast: A cross-sectional study from the National Health and Nutrition Survey in Japan

Authors:

Makiko Nakade, Megumi Tsubota-Utsugi, Eri Imai, Nobuyo Tsuboyama-Kasaoka, Nobuo Nishi, Hidemi Takimoto

Purpose:

This study aims to characterise the lifestyle and attitudinal factors associated with motivation for eating breakfast.

Methods:

A total of 3466 men and 4137 women aged ≥ 20 years completed a lifestyle questionnaire as part of the National Health and Nutrition Survey in 2009 that included questions on the frequency of breakfast skipping (skipped breakfast ≥ 2 days/week) and participants' motivation level for eating breakfast daily (being willing to stop skipping breakfast and confident of being able to do so (motivated and confident), being willing to stop skipping breakfast but not confident of doing so (motivated but not confident), or unmotivated). Stepwise multinomial logistic regression analyses were used to determine lifestyle and attitudinal characteristics associated with each level of motivation.

Results:

Breakfast skippers (600 men and 447 women) were more likely to report being smokers and feeling sleep-deprived compared with breakfast eaters regardless of level of motivation. Among men, subjects who were motivated and confident were less likely to have an understanding of healthy eating. Subjects who were motivated but not confident were more likely to perceive themselves as obese or underweight, and more likely to eat meals alone. Unmotivated men were less likely to report weight management behaviors and more likely to eat alone. Female subjects who were motivated but not confident and those who were unmotivated were less likely to have understanding of healthy eating.

Conclusions:

In order to effectively reduce the prevalence of breakfast skipping, interventions should be tailored for gender differences and motivational factors.

P289

Effects of the social environment and health information on changes in fruit intake behavior and intentions in Dutch adults: An experimental study

Authors:

Gert-Jan de Bruijn, Ilse Visscher, Saar Mollen

Purpose:

Both the healthy media environment and the social environment impact on dietary behaviors by providing information about health consequences and appropriateness, respectively. However, most studies on this issue have been done using passive designs. In the present experimental study, social norm theory and message framing theory informed the design of an experiment in which both health consequences and appropriateness of behavior were manipulated.

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Methods:

Data were collected in a sample of Dutch adults ($n=344$, $M_{age}=35.4$, 29.1% male) on fruit intake behavior and intentions, after which participants were randomly allocated to one of four conditions that manipulated type of consequences (positive consequences of action vs. negative consequences of inaction) and type of descriptive norm (the majority of Dutch adults eats vs. does not eat sufficient fruit). After manipulation, intention to eat sufficient fruit was assessed. One week later, fruit intake and intention were assessed.

Results:

There was a main effect of type of descriptive on intention, $F(1,175)=4.2$, $p=.043$ and a main effect of type of frame on fruit intake, $F(1,175)=4.4$, $p=.038$. Covariate-adjusted means showed that (1) intention was higher in those exposed to a message that highlighted that the majority of adults do not eat sufficient fruit and (2) fruit intake at follow-up was higher in those exposed to a message highlighting positive health consequences of eating sufficient fruit.

Conclusions:

For fruit intake in Dutch adults, providing information about positive health outcomes outperforms the provision of information about the social environment.

Food Insecurity

P290

Nutrition education program for food bank clients: A pilot study

Authors:

Jayna Dave, Tzu-An Chen, Karen Cullen

Purpose:

Many low income families depend on foods from food banks. The objective of the study was to determine program content and examine feasibility of a pilot nutrition education program for food bank clients.

Methods:

Formative research was conducted with staff at a local food bank and its pantries and adult clients. They helped identify program content and suggested conducting face-to-face group sessions for program delivery. Based on this information, a 6-session program was developed and tested at 6 pantries (4 intervention, 2 control). Participants completed 24-hour food records and questionnaires assessing home food availability, self-efficacy, menu planning and grocery shopping practices, family barriers to eating healthy, purchasing social support, and food preparation practices at pre and post. Analysis of covariance was conducted on nutrients and mediating variables, controlling for baseline measures and other confounders.

Results:

A total of 67 clients (46 intervention, 20 control) participated in the study. Most were females (80.6%), Black (41.8%) or Hispanic (40.3%); and reported less than high school education (43.3%) and annual incomes $< \$21,000$ (91.0%). Intervention group reported significantly higher consumptions of vegetables, whole grains, total protein, calcium, iron, and sodium, and significantly lower consumption of cakes and desserts than control group. No significant differences were found for mediating variables between the groups. Process data indicated low attendance at the sessions.

Conclusions:

Findings from this study indicate that food banks could serve as a potential channel to reach low-income high-risk individuals, with nutrition education messages to improve dietary behaviors.

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P292

Food and daily calorie intake in food insecure households in urban Iran

Authors:

Nahid Salarkia, Morteza Abdollahi, Maryam Amini, Tirang Reza Neyestani

Purpose:

To assess food intake status in food insecure households in urban areas, Iran in 2009.

Methods:

In this Cross-sectional descriptive study, 120 households from different parts of urban areas of a city in south of Tehran, were selected by a multistage sampling scheme. Household food security was measured by the Household Food Insecurity Access Scale/ HFIAS 9-item questionnaire that asks whether a specific condition associated with the experience of food insecurity ever occurred during the previous 30 days. Based on HFIAS questionnaire score, households were categorized in 4 groups including: Food secure, mildly, moderately and severely food insecure. Food Frequency Questionnaire (FFQ) was completed in interviews, to assess the utilized food in the household.

Results:

Food security was observed in 21% of households. Mildly, moderately and severely food insecure access was 46.5, 25 and 7.5 %, respectively. FFQ showed bread and cereals were the most frequently used group in the week and dairy had the highest quantity of use. The daily calorie intake of the evaluated households in the ranges of; less than 70, 70-80, 80-90 and above 90% of the Recommended Daily Allowance (RDA) was 54.3, 8.9 9.5 & 27.3%, respectively. Statistically, the daily calorie intake was different among the four mentioned groups ($P=0.024$).

Conclusions:

The consumption frequency of food groups decreased gradually from the food secure to the severely insecure groups. In more than half of the evaluated households the daily calorie intake was less than two thirds of the recommended intake by RDA.

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The relationship between food insecurity and spending on fruits and vegetables

Authors:

Iana Castro, Guadalupe Ayala, Julie Pickrel, Jennifer Sanchez, Christina Olson

Purpose:

Food insecure (vs. secure) households are those that do not always have access to adequate amounts of food that are nutritionally appropriate. The aim of this study was to determine how food insecurity is related to household food expenditures on fruits and vegetables.

Methods:

The data originated from a store-based intervention's baseline, in-person interviews that were conducted with 278 Latino store customers who were recruited while entering one of twelve sampled and recruited small stores located in San Diego County, CA. Food security was assessed with the six-item USDA measure.

Results:

A series of one-way ANOVAs revealed that, compared with food secure customers, food insecure customers perceived the cost of fruits and vegetables to be a greater barrier to consumption yet they reported spending a higher percentage of their food budget on fruits and vegetables per person ($M_{\text{foodinsecure}} = .35$, $M_{\text{foodsecure}} = .32$; $F(1, 271) = 2.77$, $p < .10$). However, no differences emerged between the dollar amount spent overall per person ($M_{\text{foodinsecure}} = 29.86$, $M_{\text{foodsecure}} = 30.91$) and specifically on fruits and vegetables per person ($M_{\text{foodinsecure}} = 10.19$, $M_{\text{foodsecure}} = 9.69$) between the two food security groups.

Conclusions:

Food insecure customers spent a higher percentage of their food budget per person on fruits and vegetables than food secure customers. Furthermore, both groups are spending similar dollar amounts, suggesting that even though cost is a greater concern for food insecure customers, food security is not a result of differences in financial resources.

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P294

Improving Healthy Eating Index scores and cooking skills among food insecure adults

Authors:

Caitlin Caspi, Cynthia Davey, Robin Frieber, Marilyn S. Nanney

Purpose:

Adults relying on emergency food may be at higher risk for poor dietary behaviors. This study aimed to evaluate the feasibility and effectiveness of a cooking and nutrition education intervention among food shelf (also known as food pantry) clients in improving diet and cooking skills.

Methods:

A 6-session class led by Share Our Strength's Cooking Matters® program was conducted in four food shelves in the Twin Cities. Diet was assessed through a 24-hour recall using Nutritional Data Systems for Research (NDSR), from which a Healthy Eating Index 2010 (HEI) score (possible range: 0-100) was created. Cooking skills were assessed through a 9-item survey addressing self-efficacy, meal preparation and planning; these items were summed into a cooking skills score (possible range: 9 - 45, Cronbach's alpha = 0.68). Paired t-tests were used to evaluate changes in HEI and cooking skills scores from baseline to post-intervention.

Results:

A total of 63 participants attended an average of 3.8 sessions. 45 participants completed both baseline and post assessments; participants who dropped out differed from others only in that they tended to be younger. Average HEI scores increased from 50.9 at baseline to 58.5 post-intervention ($p = 0.01$). Participants also demonstrated improved cooking skills scores post-intervention (35.9 vs. 33.1, $p = 0.0021$).

Conclusions:

HEI scores were low among food insecure adults, reinforcing the need to address food shelf client education and skills. Retention of food shelf clients in a multi-session intervention is feasible, and improvements in diet can be demonstrated with minimal intervention.

P295

Feasibility of a novel approach to evaluating proposed SNAP modifications

Authors:

Lisa Harnack, Simone French, Michael Oakes, Brian Elbel, Sarah Rydell

Purpose:

Changes to the Supplemental Nutrition Assistance Program (SNAP) have been proposed because participants in this food assistance program have a lower quality diet and higher risk of obesity than non-participants. Evaluating proposed changes is challenging because government approval is required to make modifications to it. Hence, we developed and evaluated the feasibility of a mock food assistance program approach for evaluating program modifications.

Methods:

20 lower income adults not participating in SNAP were recruited and randomized to one of four experimental conditions that varied with respect to whether foods high in added sugars were allowed for purchase with program benefits and whether bonus dollars were provided for the purchase of fruits and vegetables. Participants were given a debit card that had funds loaded on it monthly for use in purchasing food in accord with the 'rules' for each condition.

Results:

Most participants (17 of 20) had low or very low food security at baseline. Also, most were overweight or obese (15 of 20). The debit card system allowed for rapidly providing funds, removing funds if misuse was detected and applying a bonus for fruit and vegetable purchases. Information available from the debit card system (e.g. date and location of

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purchases) in conjunction with food receipts submitted by participants allowed for tracking compliance. All participants rated the debit card as easy or very easy to use.

Conclusions:

A mock food assistance program approach may be a viable option for evaluating proposed changes to food benefit programs such as SNAP.

P296

What Factors influence SNAP Participation? A Literature Review and Secondary Data Analysis

Authors:

Courtney Pinard, Farryl Bertmann, Carmen Byker, Daniel Schober, Michelle Woodruff, Leah Carpenter, Teresa Smith, Amy Yaroch

Purpose:

Supplemental Nutrition Assistance Program (SNAP) participation is related to improved dietary outcomes and reduced food insecurity. The purpose of this review and analysis was to identify factors across all levels of the social ecological model that positively and negatively impact SNAP participation.

Methods:

For the literature review, a snowball search strategy was utilized that included academic databases as well as grey literature. Inclusion criteria included: Written in past 20 years, in English, U.S.-based, and assessed some aspect related to SNAP participation across the social ecological model. Data for the secondary data analysis was drawn from 2012 ACS using PUMS and logistic regressions run to determine predictive abilities of household and individual level variables on SNAP participation.

Results:

Forty peer-reviewed articles and reports were included in this review. The following social ecological factors were identified as impacting SNAP participation at the societal, federal/state, community, household, and individual levels. Factors such as unemployment rates, household and family structure, education, and minority status will be interpreted and discussed through a behavioral lens with a focus on the intersection between obesity and food insecurity. The regression models demonstrated that predictors can reliably distinguish between those who participate and eligible non-participants.

Conclusions:

Findings revealed an array of factors across the social ecological model that impact SNAP participation. This framework can inform public health practitioners and SNAP stakeholders. This study contributes to a growing understanding of the role demographics and social and behavioral factors play in federal food assistance program utilization.

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P297

Potential social correlates of sedentary behaviors and physical activity in Brazilian adolescent girls

Authors:

Ana Carolina Leme, Sonia Tucunduva Philippi, Narelle Eather, David Lubans, Clare Collins

Purpose:

To examine potential social cognitive correlates of sedentary behaviors and physical activity in Brazilian adolescent girls.

Methods:

This is a cross-sectional study with 159 girls (mean age = 16.3, SD= 1.3) enrolled in high schools of the city of São Paulo. Participants completed an adapted and validated self-report questionnaire to assess potential correlates of physical activity and screen-time behaviors. Descriptive analyses, bivariate correlations and linear regression were conducted

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with differences considered significant at $p \leq 0.05$.

Results:

The physical activity average was less than ½ hour per week and the mean hours spent on screen per week were 4 hours. Bivariate analysis showed correlations between physical activity and outcome expectations for healthy eating ($\beta=0.22$, $p \leq 0.01$), healthy weight control behaviors ($\beta=0.52$, $p \leq 0.01$), behavioral strategies for physical activity ($\beta=0.50$, $p \leq 0.01$) and healthy eating ($\beta=0.30$, $p \leq 0.01$), fruit and vegetables ($\beta=0.16$, $p \leq 0.05$) and treats ($\beta=-0.34$, $p \leq 0.01$) availability at home. A negative correlation between screen-time behaviors and behavioral strategies for healthy eating ($\beta=-0.20$, $p \leq 0.05$) was found.

Conclusions:

Benefits and barriers for physical activity were associated with intake of fruit and vegetables and sugar sweetened beverages, as well as the time spent on screen-time activities. Psychological variables related to body satisfaction, weight control behaviors were also associated with frequency of physical activity behavior. The results of the current study have implications for interventions designed to promote healthy eating and physical activity in youth and suggest that these social-cognitive variables should be included as targets for change, particularly with diverse sample of adolescents.

P298

Is parental knowledge of health and developmental screen time outcomes associated with their child's TV and computer use?

Authors:

Trina Hinkley, Megan Teychenne, Helen Brown

Purpose:

Little is known about parents' knowledge of health and developmental outcomes of screen time during early childhood. This study sought to examine parents' perceptions of health and developmental outcomes of screen time in their young child and associations of that knowledge with their child's screen time.

Methods:

Mums, Dads and Kids was a cross-sectional study involving parents of 2-5-year-old children. Recruitment was via early childhood groups (e.g. preschool) and social media (e.g. Facebook) in 2013. Data collection was via an online survey. Parents reported their child's week and weekend day TV/DVD/video and computer/e-game use and their perceptions of the health and developmental outcomes of reduced screen time. Regression was used to assess knowledge of health and developmental outcomes with children's screen time.

Results:

Preliminary analyses of the first 67 mothers' data revealed that parents who believed screen time had an adverse effect on cognitive development and academic achievement had children who spent significantly less time in weekend day TV ($B=-0.4$, $p=0.06$; $B=-0.4$, $p=0.047$, respectively). Parents who believed that screen time had an adverse effect on self-esteem had children who spent significantly more time in weekend computer use ($B=0.18$, $p=0.098$). The total number of perceived adverse outcomes of screen time was not associated with children's screen time or meeting recommendations.

Conclusions:

Some associations between parental knowledge of adverse outcomes was evident and warrants further investigation. Such knowledge may provide appropriate targets for future interventions and programs to decrease screen time during early childhood.

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P299

The importance of parental encouragement of healthy eating and food preparation for children's diet and body weights

Authors:

Erin Faught, Kerry Vander Ploeg, Yen Li Chu, Kate Storey, Paul Veugelers

Purpose:

To determine the importance of parental encouragement of healthy eating and food preparation for children's diet quality, vegetable and fruit intake and body weight status.

Methods:

Survey data collected in 2010 and 2012 in Alberta, Canada from 5540 children and their parents was analyzed. Children's diet quality and vegetable and fruit consumption was self-reported. Children's heights and weights were measured for BMI calculation. Parents' encouragement of healthy habits was measured using two questions about 'encouraging your child to a) eat healthy foods and b) help choose and prepare snacks and meals'. Random effects models were applied to assess the association between parent responses and diet quality, vegetable and fruit intake and likelihood of overweight. The analysis considered relevant confounders - year, child's gender, calories consumed, school region, parental income and education level.

Results:

More parental encouragement of healthy eating and food preparation was positively associated with better diet quality and vegetable and fruit consumption. Children whose parents encouraged them to eat healthy foods 'very much' were 1.41 times more likely to meet vegetable and fruit requirements than those whose parents encouraged them 'quite a lot' (OR: 1.41 [95%CI: 1.20, 1.65]). More parental encouragement of eating healthy foods was associated with decreased likelihood of child overweight, though this was not statistically significant.

Conclusions:

Health promotion strategies that target parents to encourage their children to eat healthy foods and participate in food preparation may improve the diet quality and fruit and vegetable intake of children and decrease likelihood of future chronic disease.

P300

Maternal and paternal parenting practices and their influence on children's adiposity, screen-time, diet and physical activity

Authors:

Adam Lloyd, David Lubans, Ronald Plotnikoff, Clare Collins, Philip Morgan

Purpose:

Children's lifestyle behaviors and weight status are influenced by parenting practices, yet most studies report data from mothers only. The aims of this study were to examine (i) if there was a difference between maternal and paternal physical activity- and dietary-related parenting practices, and (ii) a range of potential behavioral and maternal/paternal correlates of adiposity, screen-time, diet and objectively measured physical activity in a sample of primary school-aged children.

Methods:

Cross-sectional analysis was conducted using a sample of 70 families. Parenting practices were measured using the Parenting Strategies for Eating and Activity Scale. Differences between mothers' and fathers' parenting practices were investigated using paired sample t-tests and multiple regression models were generated to examine the associations between maternal and paternal parenting practices and children's variables.

Results:

Mothers' control was significantly lower ($p < 0.001$) and limit setting ($p < 0.01$) and monitoring ($p < 0.001$) were significantly higher than fathers. Fathers' BMI ($p < 0.01$) and mothers' control ($p < 0.001$) were significantly associated with child weight status. For screen-time, mothers' monitoring ($p < 0.001$) and child characteristics [age ($p = 0.01$), sex ($p = 0.01$),

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BMI z-score ($p=0.03$)] were significant predictors. Mothers' parenting practices [limit setting ($p=0.01$), reinforcement ($p=0.02$)] and child screen-time ($p=0.02$) were significantly associated with core foods. Fathers' reinforcement ($p<0.01$) was significantly associated with child physical activity.

Conclusions:

Despite some similarities within couples, fathers and mothers differ in their use of specific physical activity- and diet-related parenting practices. When designing lifestyle interventions targeting children, both mothers and fathers should be involved.

P301

5th graders' physical activity and dietary behaviors: Focus groups with parents

Authors:

Thrudur Gunnarsdottir, Michelle Cardel, Candace Brown, Richard Boles, Megan Mistler-Jackson, John Peters, James Hill

Purpose:

To explore parental views of 5th graders' dietary behaviors and physical activity (PA), and how parents discuss these topics with their children.

Methods:

Utilizing grounded theory, four focus groups were conducted with parents of 5th graders ($n=25$) as part of formative research for an obesity prevention program in Colorado, 5th Gear Kids. Convenience sampling included parents of students from higher-income (HIGH) and lower-income (LOW) schools, as measured by eligibility for free-and-reduced-lunch (FRL%). Two groups ($n=12$, LOW) were from diverse racial/ethnic backgrounds (average FRL=74.8%). Two other groups ($n=13$) included predominantly white participants ($n=10$, HIGH, average FRL=22.5%).

Results:

Both HIGH and LOW discussed the importance of children engaging in PA and healthy dietary behaviors and felt like their children shared that perception. Themes identified among LOW included authoritarian-like parenting when discussing these topics with their children, an expression of responsibility and assertion of power, whereas HIGH avoided discussing this with their children and preferred to lead by example due to concerns about development of eating disorders and body image issues. Among both groups, various activities (e.g. sports games, parties) revolving around unhealthy food were identified as a barrier to healthy eating, whereas homework and weather constraints were barriers to PA.

Conclusions:

Encouraging 5th graders to engage in healthy dietary behaviors and PA is a topic of importance to parents. Exploring similarities and differences between parents of varying socioeconomic statuses and race/ethnicities in their views of 5th graders' dietary- and PA behaviors, should be examined in future studies.

P302

Predicting use of ineffective vegetable parenting practices with the model of goal directed behavior

Authors:

Tom Baranowski, Alicia Beltran, Tzu-An Chen, Debbe Thompson, Teresia O'Connor, Sheryl Hughes, Cassandra Diep, Janice Baranowski

Purpose:

Increasing a parent's ability to influence a child's vegetable intake may require reducing the parent's use of ineffective vegetable parenting practices (IVPP).

Methods:

To understand the influences on IVPP, this study modeled use of IVPP using validated scales from a Model of Goal Directed Vegetable Parenting Practices (MGDVPP) from a cross-sectional internet survey. Parents of 307 preschool (3-5 y) children were recruited through announcements. The dependent variable was a composite IVPP index. The independent

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variables included validated subscales of intention, habit, perceived barriers, desire, competence, autonomy, relatedness, attitudes, norms, perceived behavioral control, and anticipated emotions. Models were analyzed using block regression with backward deletion.

Results:

Variables significantly positively related to IVPP in order of relationship strength included habit of controlling vegetable practices (standardized $B = 0.349$, $p < 0.0001$) and desire (standardized $B = 0.117$, $p = 0.025$). Variables significantly negatively related to IVPP included perceived behavioral control of negative parenting practices (standardized $B = -0.215$, $p < 0.000$), the habit of active child involvement in V selection (standardized $B = -0.142$, $p = 0.008$), anticipated negative parent emotional response to child V refusal (standardized $B = -0.133$, $p = 0.009$), autonomy (standardized $B = -0.118$, $p = 0.014$), attitude about negative effects of vegetables (standardized $B = -0.118$, $p = 0.015$), and descriptive norms (standardized $B = -0.103$, $p = 0.032$). The model accounted for 40.5% of the variance in use of IVPP.

Conclusions:

Innovative intervention procedures will need to be designed and tested to reduce IVPP.

P303

Cultural and environmental influences on feeding and parental involvement in daycares among Hispanic parents

Authors:

Nooreem Mena, Geoffrey Greene, Kathleen Gorman, Alison Tovar

Purpose:

Tailored interventions to prevent obesity early in the daycare setting among Hispanics are needed. The goals of this qualitative study were to 1) explore precursors and contextual influences on parental feeding and 2) explore ways to engage parents within the daycare setting.

Methods:

Hispanic parents of pre-school aged children recruited from two daycare facilities in Rhode Island participated in one of four focus groups ($n=37$). Guiding questions focused on cultural, social and environmental influences on child feeding both at home and in the daycare setting, and barriers perceived related to involvement in daycare nutrition programs. Content analysis was used to analyze themes coded for using NVivo10.

Results:

External factors including current health concerns, culture, spouse and childhood experiences among the parents influence how and what parents feed their child. Although many parents reported using rewards and punishments to get their child to eat, covert control strategies were also reported. Overall parents were not aware of what their child was eating at the daycare, but reported being concerned about their child being hungry. Parents also suggested use of text messages and email as a way of involvement daycare programs.

Conclusions:

Past experiences and family culture influence how Hispanic parents feed their children. Broader social and environmental influences on feeding need to be considered in tailoring interventions. In order to better engage Hispanic parents within the daycare setting, combining in person interventions with newer technologies, while being culturally sensitive may help reduce childhood obesity risk in this population.

P304

Increasing physical activity in Latinas: The moderating effect of family ties

Authors:

Britta Larsen, Shira Dunsiger, Dori Pekmezi, Bess Marcus

Purpose:

Physical activity (PA) interventions can increase PA in Latinas, yet it is unclear if family obligations such as childcare, often cited as a barrier in this population, impede the success of these interventions. The purpose of the current study was to assess the potential moderating effects of family relationships on the success of PA interventions for Latinas.

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Methods:

Underactive adult Latinas (N=266) were randomized to an individually tailored print-based PA intervention or a wellness contact control. PA and self-efficacy were measured at baseline and six months using the 7-Day Physical Activity Recall Interview and a validated Self-Efficacy for PA inventory, respectively. Participants indicated at baseline if they had children under 18, children under 5, and whether they were married/living with a partner.

Results:

There were no differences at baseline in PA or self-efficacy based on any family ties. Participants in the intervention condition who had children under 18 had somewhat smaller gains in PA at six months than women without children, while there was no difference for women in the control group (p-for-interaction=.07). However, intervention participants with children still increased PA somewhat more than women with children in the control group (mean change = 55.65 vs. 31.01 min/week, respectively, p=.07). Self-efficacy increased more for intervention participants (p<.01), but more so for women without children under 5 (p-for-interaction=.02). There were no interactions with marital status.

Conclusions:

Having young children may decrease the effectiveness of PA interventions for Latinas. However, these women still increased PA and self-efficacy despite this barrier.

P305

Relationship between parental concern and perception of child weight and obesogenic parenting practices

Authors:

Katheryn Swyden, Susan Sisson, Amanda Sheffield-Morris, Kristen Copeland, Karina Lora, Ashley Weedn, Beth DeGrace

Purpose:

To examine parental concern and perception of child weight in relation to obesogenic parenting practices.

Methods:

Parents of children ages 3-5 years (n=152) completed the Perceived Child Weight, Concern about Child Weight and the pressure, restriction and monitoring to eat factors of the Child Feeding Questionnaire to determine perception (overweight vs. healthy weight) and concern (concern vs. not concern) of child weight and assess parenting feeding practices. Child height and weight were measured and body mass index percentile (BMI%ile) calculated. Perception and concern were examined in relation to individual feeding practices, factors and BMI%ile using Chi-Square and independent t test.

Results:

Over half (56.8%) of parents were concerned about their child's weight; 6.8% perceived their child to be overweight. Restriction (3.47 ± 0.78 ; 2.92 ± 0.92 ; $p \leq 0.001$) and child's BMI%ile (75.0 ± 24.2 ; 54.0 ± 29.5 ; $p \leq 0.001$) were higher among concerned parents; no difference was present for perception. Parents who perceived their child as overweight agreed vs. disagreed to keeping foods out of reach (67.0% vs. 25.0%, $p=0.017$). Parents concerned about child weight agreed vs. disagreed to making sure child does not eat too many high fat foods, too many favorite foods, and too many sweets (71.6% vs. 28.4%, $p \leq 0.001$; 52.2% vs. 47.8%, $p=0.023$; 88.6% vs. 13.4%, $p \leq 0.001$).

Conclusions:

Parental recognition of child overweight seems to prompt parents to engage in restrictive feeding practices. Child weight relates to parenting practices and parents concerned about child weight likely use restriction.

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P306

Perceived parental support and its effects on adolescent's diet and exercise behavior prior to a weight loss intervention

Authors:

Katie McInnis, Roberta Anding, Connie Wiemann, Eric Calloway, MJ Romo Palafox, Margaret Briley

Purpose:

This study examined the relationship between perceived parental support and adolescent diet and physical activity patterns in order to create effective behavioral interventions.

Methods:

Obese adolescents (n=44) (age 11-14) beginning a weight-loss intervention completed the School and Physical Activity and Nutrition Questionnaire as part of a larger study. A parental support subscale was created consisting of six questions ($\alpha = 0.62$), which was considered moderately acceptable. Twenty-four hour food frequency and 7-day physical activity frequency questions were used to obtain data. T-test analyses detected significant differences in behaviors between parental support groups.

Results:

Subjects (84%) reported their parents would be very upset if they learned they were not exercising or eating fruits and vegetables. Only 20% of parents consistently exercised with their child and 38% ate fruits and vegetables with their child regularly. Adolescents who scored highest on the parental support subscale were significantly more likely to eat vegetables (2.04 ± 1.85) than those with the lowest support (0.6 ± 1.04), ($t(42)$, $p=0.004$). Participants were also more likely to be active with high (4.46 ± 1.91) vs. low support (0.70 ± 0.92), ($t(42)$, $p<0.001$). Similar trends appeared with fruit consumption (1.25 ± 1.39 ; 0.70 ± 0.92) however, results were not significant ($t(42)$, $p=0.14$).

Conclusions:

Adolescents with high parental support were more likely to be active and eat more vegetables than those who perceived low support. More research is needed examining the relationship between perceived support, actual support and how they affect eating and exercise habits of obese adolescents.

P307

Mother child interactions and children's eating in the absence of hunger: Study of low-income Latina mothers

Authors:

Karina Silva, Thomas Power, Jennifer Fisher, Teresia O'Connor, Sheryl Hughes

Purpose:

This study examined the relationship between maternal behavior and children's eating in the absence of hunger (EAH). Because previous research has relied on maternal self-reports of feeding, we used observational methods to assess maternal behavior. To examine maternal autonomy promotion, we observed mothers' serving behavior during a buffet meal. We predicted that autonomy promoting serving practices would be negatively associated with EAH.

Methods:

186 low-income Latina mothers and their 3-5 year old children came to a laboratory. On one day, mothers served their child a buffet meal; on the second, the child completed the EAH task. For each food served, seven measures of autonomy promoting practices were derived.

Results:

Factor analysis on the serving scores yielded three factors: Gives child choice, child serves food, and food ends up on plate. Results showed a curvilinear relationship: Children whose mothers were low or high on autonomy promotion during serving were least likely to eat in the absence of hunger.

Conclusions:

As expected, EAH was associated with autonomy promoting strategies. However, children whose mothers provided no autonomy also ate little in the absence of hunger. Possibly, children of highly controlling mothers may have worried

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that their mothers would find out how much they ate, so they ate few of the snack foods. We are currently analyzing the videotapes to see if children of highly controlling mothers exhibited more stress behaviors during EAH task. Implications of these findings for the socialization and assessment of the self-regulation of eating will be considered.

P308

Factors predicting intervention fidelity of a family-based dietary intervention

Authors:

Emily Schmied, Lucy Horton, Humberto Parada, Elva Arredondo, John Elder, Guadalupe Ayala

Purpose:

The evaluation of factors contributing to program implementation is a cornerstone of implementation science, which emphasizes the importance of understanding why interventions work. Based on these principles, this study evaluated predictors of intervention fidelity of Entre Familia: Reflejos de Salud, a family-based, randomized controlled trial shown to improve dietary practices of Mexican-American families.

Methods:

Linear regression assessed predictors of family member attendance at promotora visits, a measure of implementation fidelity. One hundred eighty families (180 mothers, 159 children, 39 fathers) and six promotoras completed questionnaires prior to, during, and following the 12-week intervention. Predictors examined included participant and promotora characteristics, participant satisfaction with intervention delivery and materials, participant rating of effort, promotora rating of family engagement during home visits (i.e. attentiveness, receptivity), and promotora rating of how much the home supported healthy lifestyle behaviors (i.e. availability of healthy foods, number of televisions). All variables significant at the bivariate level ($p < .10$) were added to a multivariate model.

Results:

In bivariate analyses, several variables emerged as predictors of family member attendance. The child's rating of the family's behavior change efforts and the child's satisfaction with the quantity of promotora visits predicted family attendance at promotora visits ($p < .05$), and mother's age and the family's financial status approached significance ($p < .10$). In the multivariate model, only child's rating of the family's behavior change efforts remained significant ($p < .05$).

Conclusions:

This study examined factors related to intervention fidelity in a family-based dietary intervention. Results indicate that the child's perceptions of the intervention may drive family engagement.

P309

The effect of parental outcome expectations for child TV viewing on parenting practices and child TV viewing

Authors:

Teresa O'Connor, Tzu-An Chen, Lauren Johnson

Purpose:

Although restrictive parenting practices are effective in reducing children's television viewing, not all parents use them and it is currently unclear why. The current study examined parenting practices related to television viewing in the context of social-cognitive theory. Specifically, we hypothesized that parental positive and negative outcome expectations for child television viewing would be associated with restrictive and social co-viewing parenting practices respectively.

Methods:

311 parents of 6-12 year old children completed an online survey asking, in part, about sociodemographic information, parenting practices related to television use, parental outcome expectations for child's television viewing, and his/her child's television viewing behaviors. Structural equation modeling (SEM) was used to examine the relationship amongst variables in separate models for weekday and weekend television viewing. Each model controlled for child age, highest household education, and parental television viewing.

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Results:

Parental outcome expectations appear to have the strongest impact on social co-viewing, though positive outcome expectations were negatively associated with restrictive practices on both weekdays and weekends. Restrictive TV parenting practices appear to have a protective, weak effect on children's TV viewing on weekdays, but not weekends. The presence of a television in the child's room was the largest predictor of child television viewing on weekends, though it was unrelated to television viewing on weekdays.

Conclusions:

The results suggest that interventions to reduce television viewing should focus on removing televisions from children's rooms. Highlighting negative outcomes associated with television viewing and providing alternative ways to entertain/occupy children may assist in making this change.

P310

Characterizing the home food environment using cluster analysis

Authors:

Stephanie Mazzucca, Derek Hales, Dianne Ward

Purpose:

To explore patterns of foods available in homes with children ages 3-12.

Methods:

As part of a larger project to develop an assessment of the home food and physical activity environment, trained research staff observed amount of foods and beverages in 125 homes with at least 1 child 3-12 y. Parents completed a demographic survey. BMI was calculated from measured heights and weights collected on the index parent and child. K-means cluster analyses were conducted (STATA 12) using standardized ounces of 11 food and beverage groups (e.g., fresh fruits and vegetables - FFV, salty snacks, etc.). Descriptive statistics were calculated for each cluster (SAS v9.3).

Results:

A 5-cluster solution was selected from fit statistics and interpretability. One cluster was characterized by low amounts of all foods and comprised of more lower-income, less educated, or African-American participants compared to other clusters. Another cluster was characterized by higher amounts of unhealthy foods and less FFV; relatively more overweight/obese parents fell into this cluster. A third cluster was characterized by high amounts of candy and FFV, and a fourth cluster had high amounts of FFV and yogurt/cheese. These clusters were comprised of mostly homes with higher educated, higher income, or White families. A small, fifth cluster (n=4) with highest amounts of all foods but low FFV also emerged.

Conclusions:

This analysis highlights several patterns of foods available in homes and demonstrates differences in parent and child characteristics by pattern. Understanding these patterns may inform programs to modify the home food environment.

P311

Parental perception on children's after-school physical activity participation: Lesson from a pilot study

Authors:

PY Peggy Cheung, Li Zhang

Purpose:

Parental influence on physical activity (PA) participation of children have been widely studied, however, limited knowledge was reported particularly on after-school hours. The purposes of this study were: 1) to explore the parental perception on children's after-school activity participation; and 2) to examine the changes of parental views on children's after-school PA participation following a pilot program.

Methods:

The pilot study was a 6-week program conducted in one primary school with a group of seven children (aged 8-9) in Hong Kong. In order to attract support from parents, the after-school program was academic tutorial focused with an

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additional PA session included. A 60-minute focus group with the parents as participants was conducted before and after the pilot program. Data was analyzed using thematic approach to interpret parents' view on after-school PA participation of their children.

Results:

Results generated major themes about factors that parent concerns on children after-school hour activity, including academic performance, social support and physical health. Comparing the pre- and post- program data, children experience was identified as additional theme that aroused parental support on after-school PA participation of children.

Conclusions:

The present study identified parental views on after-school PA participation of children. In addition, the pilot program included a combination of PA and academic component presumed to satisfy the concern of parents. The findings can add information for future intervention design to increase the PA level of children during after-school hour.

P312

Parental support in relation to physical activity in urban African American adolescent girls: A multi-informant model

Authors:

Yan Wang, Erin Hager, Raquel Arbaiza, Samantha Wilkes, Larry Magder, Reem Sharaf, Treuth Margarita, Maureen Black

Purpose:

Adolescent girls are at particularly high risk for inactive lifestyles, increasing their risk for obesity. This study examined how physical activity (PA), measured by accelerometer, relates to parental support for PA among early adolescent, urban mainly African American girls. Parental support was collected from parents and adolescents. We hypothesized that there is discrepancy in the relationship by informant, and the relationship varies by adolescent overweight/obesity.

Methods:

The sample included 301 sixth-grade adolescent girls and their parents. All parents and adolescents completed a 10-item Social support and Exercise Survey on perceived parental support for PA. PA was assessed by accelerometry worn on the ankle for 7 days and analyzed to assess minutes in moderate-vigorous physical activity (MVPA). The multi-informant model assessed the variation in the PA-parental support relationship by informant, adjusting for covariates.

Results:

19% girls were physically active (MVPA \geq 60 min/d). The relationship between parental support and PA varied by informant ($P > 0.05$). Adolescent-perceived parental support was related to greater likelihood of being physically active (aOR=2.7, 95% CI: 1.3-5.4, $p=0.007$), but not parent-reported parental support ($p > 0.05$). Additional analyses suggest that parental logistic support (e.g., scheduling the physical activities), rather than encouragement or being physically active together, is linked to high PA. Relationship between parental support and PA did not vary by adolescent overweight/obesity.

Conclusions:

Adolescent-perceived parental support was associated with increased PA among early adolescent, urban mainly African American girls. Strategies to help parents provide logistical support for PA may help increase PA in adolescents.

P313

Mother-child dyads' patterns of daily physical activity and sedentariness

Authors:

Louise Hardy, Jason Bennie, Li Ming Wen, Louise Baur, Chris Rissel

Purpose:

Motherhood represents a critical window of change in the life-course including physical activity levels. No studies have objectively examined the daily cadence (patterns) of physical activity (PA) among dyads of preschool aged children and mothers. In this study we examined mother-child dyads' PA levels across week and weekend day at different times of the day.

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Methods:

Accelerometer data of 45 mothers and their 3.5-year old child were categorised according to adult and child-specific cut-points (sedentary (SED), light-(LPA) moderate-to-vigorous (MVPA) physical activity and MVPA bouts >10mins). Paired-T-tests were used to examine mother-child differences in SED/LPA/MVPA by type and time of day.

Results:

Compared to their child, mothers spent significantly less time in each activity category per day, except LPA (difference; 253.9mins, $P<0.001$). Children spent approximately 50% more time in daily MVPA, averaging an additional 59.3mins/day ($P<0.001$). There was a fourfold difference between mother and child and the number of daily MVPA bouts >10mins (0.5vs2.0; $P<0.001$).

Conclusions:

Dyads' daily sedentariness and LPA was congruent, increasing from early morning, peaking in early afternoon and decreasing in late afternoon. Conversely dyad's pattern of MVPA, were divergent, with mothers maintaining very low levels of MVPA across the day while their child's MVPA and MVPA bouts increased during the morning and decreased around 7pm. The findings suggest that different times of the day may hold promise to encourage mothers to increase their MVPA concurrently with their child's which may in turn provide a positive feedback loop to increasing MVPA in mother-child dyads.

P314

Parent-adolescent correlation of physical activity, sedentary behaviors, and sleep

Authors:

Andrew Tu, Allison Watts, Louise Masse

Purpose:

The purpose of this study was to examine the correlation between parent and adolescent levels of physical activity, sedentary behaviors, and sleep among a group of overweight and obese adolescents.

Methods:

Baseline data of parent-adolescent pairs who enrolled in an E-health lifestyle modification intervention were analyzed for this paper ($n=176$). Participants completed questionnaires about their sedentary behaviors (tv, video game, and computer time), wore an accelerometer for eight days, and completed a sleep diary for 1 week. In total, 100 parent-adolescent pairs provided valid data for the analyses. Data from the accelerometers were used to calculate minutes of moderate-to-vigorous activity (MVPA), step counts, and sedentary time. Multivariable regression analysis was conducted to assess the relationship between parents and adolescents. Analysis was split by weekday and weekend.

Results:

On average, adolescents had more minutes of MVPA (27 vs. 23), steps (8101 vs. 7463), and hours of sleep (9.6 vs. 8.5) and spent less time sedentary (61.5% vs. 62.8%) than their parents. Parent-adolescent MVPA was significantly associated on weekdays ($b: 0.224$; $SE: 0.108$; $B: 0.241$) and weekends ($b: 0.296$; $SE: 0.126$; $B: 0.267$). Parent-adolescent step counts were only associated on weekends ($b: 0.257$; $SE: 0.124$; $B: 0.229$). Adolescent sedentary behaviors were not associated with parental sedentary behaviors. Adolescent sleep was associated with parental sleep on weekdays ($b: 0.402$; $SE: 0.084$; $B: 0.483$).

Conclusions:

Parent and adolescent levels of physical activity and sleep were correlated. Interventions targeting lifestyle modifications of overweight and obese adolescents may benefit by also modifying parental behaviors.

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P315

Feasibility and preliminary efficacy of the Mothers and Daughters Exercising (M.A.D.E.) 4 Life pilot randomized controlled trial

Authors:

Alyce Cook, Ron Plotnikoff, Clare Collins, Philip Morgan

Purpose:

The aim of the Mothers and Daughters Exercising (M.A.D.E.) 4 Life study was to assess the feasibility, acceptability, and preliminary efficacy of an after-school physical activity (PA) program targeting mothers and daughters.

Methods:

A pilot randomised controlled trial was conducted with 48 primary school-aged girls (mean [sd] age=8.4 [1.7] years; BMI z-score=0.7[1.2]) and their 40 mothers (mean [sd] age=39.1 [4.8] years; BMI=27.6 [5.5]). Mothers and daughters were randomised to either (i)M.A.D.E 4 Life program or (ii)a wait-list control. The program involved 8 weekly sessions that included a 30-minute education session followed by a 60-minute PA session. Participants were assessed at baseline, 10 weeks (post-test), 20 weeks (follow up). The primary outcome was girls MVPA (accelerometry). Secondary outcomes included: Objectively measured PA, BMI, waist-circumference, body composition, sedentary behavior and screen time. Maternal outcomes included parenting for PA and social cognitive mediators.

Results:

Retention was 93% at 20-weeks, average attendance rate for sessions was 82%. Intention-to-treat analysis using linear mixed models revealed a significant intervention effect for maternal PA role modelling ($P=0.02$, $d=0.11$). No significant differences were found for PA or other secondary outcomes. Process evaluation data revealed high satisfaction scores for the program.

Conclusions:

The M.A.D.E 4 Life program was feasible with high retention and attendance rates and satisfaction scores for mothers and daughters. While the M.A.D.E 4 Life program positively impact on maternal PA role modelling; there was no effect for PA. Statistically powered experimental studies targeting mothers as agents of change promoting increased PA among girls are warranted.

P316

Feasibility and acceptability of Brighterbites, a program increasing access to fresh fruits and vegetables and nutrition education among low-income children and their families

Authors:

Shreela Sharma, Christine Markham, Lisa Helfman, Katherine Albus, Ru-Jye Chuang, Michael Pomeroy

Purpose:

To describe results of the Brighterbites feasibility study, a school-based program providing nutrition education and consistent access to fresh fruits and vegetables (F&V) to increase demand and intake of F&V among low-income families.

Methods:

Brighterbites is a 16-week program comprising: 1) Weekly distribution of ~50 servings of fresh, donated F&V from the Houston Food Bank, costing \$4.70 per family/week; 2) Bilingual parent handouts and recipe samples; and 3) CATCH, a coordinated school health program. The pilot used a pre-post evaluation design at one Houston, Texas school ($n=57$ 3rd grade families; 97% Hispanic, 91% low-income). Evaluation (baseline, 8 weeks, 16 weeks) comprised self-reported child and parent surveys. Pearson's chi-square test, Fisher's exact-test or paired t-test were used to determine changes from baseline to midpoint and post-intervention. Process data were gathered to determine program feasibility and acceptability.

Results:

Results showed significant increases from baseline to post-intervention in child and parent self-efficacy, outcome expectations and attitudes towards consuming F&V ($p<0.05$). Child preference of F&V including green vegetables increased from baseline to post- intervention ($p<0.05$). Parent data showed improvements in mealtime practices at

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home, including more children requesting F&V as snacks ($p < 0.05$). There was no significant increase in child frequency of F&V intake from baseline to post-intervention. Process data showed 98% retention rate, low produce cost, and strong parent and school acceptability.

Conclusions:

Brighterbites is a promising strategy to increase demand and intake of F&V in low-income populations using existing infrastructure of schools and food banks. A broader efficacy study is underway.

P317

Associations between family-related factors and breakfast frequency, fruit juice and soft drink intake among 10- to 12-year-old European children: The ENERGY project

Authors:

Wendy Van Lippevelde, Saskia Te Velde, Maïté Verloigne, Maartje Van Stralen, Ilse De Bourdeaudhuij, Elling Bere, Johannes Brug, Lea Maes

Purpose:

The aim of this study is to investigate associations of family-related factors with children's fruit drink/juice, soft drink and breakfast consumption.

Methods:

A cross-sectional survey among 10- to 12-year-old children and their parents in eight European countries was conducted to gather this data. Key variables of interest were children's self-reported breakfast frequency per week, fruit drink/juice and soft drink intake per day (outcome) and family-related factors (based on parents' report) related to these three behaviors (modeling, automaticity, availability, monitoring, permissiveness, negotiation, communication about health beliefs, avoid negative modeling, self-efficacy, rewarding, and family consumption). 7915 Children (52% girls; mean age = 11.7 ± 0.8 years) and 6512 parents (83% women; mean age = 41.4 ± 5.3 years) completed the questionnaire. Multilevel regression analyses (child-school-country) were used to examine the aforementioned associations.

Results:

Three of the 11 family-related factors (modeling, availability, and family consumption) were positively associated with children's fruit drink/juice and soft drink intake. Additionally, three family-related factors (permissiveness, monitoring, and self-efficacy) were solely associated with soft drink intake and one family-related factor (communicating health beliefs) was related to fruit drink/juice intake. All family-related variables except for negotiation, rewarding, and communicating health beliefs, were significantly associated with children's breakfast frequency.

Conclusions:

Future interventions targeting children's breakfast frequency, fruit drink/juice, and soft drink intake should focus on the home environment -parents and their practices- especially on the role model behavior of parents and the availability of the food products at home.

P318

Improving dietary quality in youth with type 1 diabetes: Efficacy of a family-based behavioral intervention

Authors:

Tonja Nansel, Lori Laffel, Denise Haynie, Sanjeev Mehta, Leah Lipsky, Lisa Volkening, Debbie Butler, Aiyi Liu

Purpose:

Diets of children with type 1 diabetes are low in fruits, vegetables, and whole grains, and high in foods of minimal nutritional value, increasing risk for adverse health outcomes. This 18-month randomized clinical trial tested the efficacy of a family-based behavioral intervention integrating motivational interviewing, active learning, and applied problem-solving to increase whole plant food intake.

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Methods:

Participants were 136 youth with type 1 diabetes (age 12.4 ± 2.5 , diabetes duration 8.9 ± 3.1 , A1c 8.1 ± 1.0 , 31.6% pump). Dietary intake was assessed using 3-day diet records every 3 months; Nutrient Data Systems for Research program calculated food group intake (cup equivalents per 1000 kcal) and Whole Plant Food Density (WPFD; total cup equivalents of fruit, vegetables, whole grains, legumes, nuts, and seeds per 1000 kcal). A1c was obtained every 3 months in a standardized laboratory. T-tests examined group differences on outcomes at 12 and 18 months. Longitudinal analyses (SAS Proc Mixed) compared rates of change over time.

Results:

An intervention effect on WPFD was observed at each follow-up ($p = .02$) and in the mixed model assessing change over time ($p = .02$). At 18-month follow-up, WPFD was on average .48 cup equivalents per 1000 kcal greater in intervention subjects than control subjects. This difference was attributed to greater whole grain ($p = .03$) and whole fruit ($p = .03$) intake; there were no differences in vegetable intake. A1c change over time did not differ between intervention and control groups.

Conclusions:

This behavioral nutrition intervention improved dietary quality among youth with type 1 diabetes, with no adverse impact on glycemic control.

P319

Stressors associated with the emotional climate of the parent-child eating relationship

Authors:

Sheryl Hughes, Theresa Nicklas, Yan Liu, Thomas Power

Purpose:

Depression and other stressors have been associated with general parenting and child outcomes in low-income families. Given that parents shape child eating behaviors through their feeding interactions with their child, it is important to investigate factors that may influence the emotional climate of the parent-child eating relationship. The aim of this study was to examine how parenting stress and depressive symptoms might influence the nature of maternal feeding styles in low-income families.

Methods:

Questionnaires were completed by 290 Black and Hispanic Head Start parents residing in a large urban city in southwestern United States. Twenty-six percent of the parents reported depressive symptoms. Logistic regression was used to evaluate the relationship between maternal depressive symptoms, parenting stress, and maternal feeding styles.

Results:

The relationship of feeding styles with maternal depression and stress was assessed using multivariate logistic regression analyses. After adjusting for potential confounding variables (e.g., education, maternal age, marital status), parents with an uninvolved feeding style reported less positive affect and more parenting stress than parents showing the authoritative, authoritarian, or indulgent feeding styles ($X^2 = 46.9$, $p = .0004$).

Conclusions:

The results of this study provide important information regarding how maternal factors related to the uninvolved feeding style may inadvertently promote less optimal child eating behaviors and possibly the development of childhood obesity. This information could be useful for prevention studies aimed at changing parent behaviors that negatively impact the socialization of child eating.

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Do children of stressed parents eat differently? Parental stress and child intake of sugar-sweetened beverages and sugar

Authors:

Eleanor Tate, Mary Ann Pentz, Genevieve Dunton

Purpose:

Parental stress has been associated with children's obesity risk, but the mechanisms underlying this link are unknown. This study tested the interaction between parents' stress and rules about child eating on child dietary intake of sugar-sweetened beverages (SSBs), added sugar, and fat.

Methods:

Participants were 602 parent/child dyads. Parents were 80% mothers, 51% Hispanic, 39.21 (\pm 5.99) yrs. old and 35% obese. Children were 47% female, 11.28 (\pm 1.54) yrs., and 20% obese. Parents were divided into four groups by median splits on stress (high v. low) (4-items: Cohen Stress Scale, 4 - 20; median = 9) and rules (high v. low) (2 items: Having and Explaining, 1 - 5, median = 3.5). The Block Kids Screener assessed child diet.

Results:

Adjusting for child gender, ethnicity, free lunch, and BMI z-score, added sugar intake, $F(3, 527) = 5.03$, $p < 0.01$ and SSB kcals, $F(3, 126) = 2.95$, $p = 0.03$ differed across groups. Tukey's post-hoc comparisons were conducted. Children of low-stress parents consumed more added sugar and SSB kcals when parents had low vs. high rules ($p < 0.05$). Children ate more added sugar when high-stress parents had low-rules than low-stress parents with high rules ($ps < 0.05$).

Conclusions:

Parents' rules about child eating may be more effective at decreasing dietary sugar and SSB kcals for low-stress parents because rules are difficult to enforce under stress. Obesity prevention programs may decrease child sugar consumption by reducing parental stress or bolstering parents' ability to enforce rules when under stress.

P321

Associations between specific food parenting practices, parental self-efficacy concerning food parenting practices and fruit juice, soft drink and water intake among primary school children

Authors:

Sara De Lepeleere, Maïté Verloigne, Greet Cardon, Ilse De Bourdeaudhuij

Purpose:

The aim of this study was to investigate associations of specific food parenting practices and related parental self-efficacy (SE) with children's fruit juice, soft drink and water consumption. Furthermore, maternal and paternal BMI, family SES, and child's age were examined as possible moderators.

Methods:

A cross-sectional self-report survey among 182 parents (75% women; mean age = 39.0 \pm 5.4 years) of 6- to 12-year-old children was conducted to gather this data. Multiple linear regression and moderated multiple regression analyses were used to examine the aforementioned associations.

Results:

Parental motivating and parental SE concerning motivating were positively associated with children's water consumption ($p < 0.05$; $p < 0.001$). Maternal BMI significantly moderated both associations (both $p < 0.05$): Motivating was more strongly associated with water consumption for mothers with a high BMI and SE concerning motivating was only associated with water intake when mothers had a normal BMI. Parental SE concerning motivating was negatively associated with soft drink consumption ($p < 0.01$). Parental SE concerning monitoring was negatively associated with children's fruit juice consumption ($p < 0.01$). Paternal BMI was a significant moderator in this association ($p < 0.05$): SE concerning monitoring was only associated with fruit juice consumption when fathers had a normal BMI.

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Conclusions:

Future interventions targeting children's fruit juice, soft drink and water intake should focus on multiple parenting practices and parental self-efficacy and should take parental BMI into account.

P322

Is children's pestering for food purchases related to diet and weight outcomes? Evidence from the multi-country IDEFICS study

Authors:

Christina Huang, Lucia Reisch, Lauren Lissner

Purpose:

Children may influence household spending through their parents using "pester power," where children request items repeatedly to persuade their parents to buy them. This study prospectively examines parent-child shopping behaviors across eight countries to identify predictors of children's diet and weight.

Methods:

This study is part of the prospective multi-country IDEFICS (Identification and prevention of dietary- and lifestyle-induced health effects in children and infants) study. The analysis includes 12,969 parent-child dyads with measured height and weight and parent-reported information on diet and behavior at baseline and 7,562 dyads after two years.

Results:

At baseline, most parents (60%) reported "sometimes" purchasing their children's requests, with some differences by country. Children whose parents often acquiesced consumed greater proportions of sugar and fat in their diet (3.7 and 2.0 percentage points, respectively), but were not more likely to be overweight or obese. Avoiding taking the child grocery shopping because the child pushed for treats and often asking for items from television were both independently associated with higher sugar and fat diets and greater BMIs. At the two-year follow-up, children who often asked for items were more likely to become overweight (OR=1.36), while never asking for items was protective against overweight (OR=0.61) and obesity (OR=0.70).

Conclusions:

Pestering was modestly related to diet and weight. Children whose parents avoided shopping with them were heavier and had worse diets, which may suggest reverse causality. The relationship between asking for items from television and weight over time suggests that limiting television advertising may foster healthier outcomes.

P323

Stuck in a vicious cycle of stress - parental concerns and barriers to changing children's dietary habits and physical activity

Authors:

Åsa Norman, Anita Berlin, Elinor Sundblom, Liselotte Schäfer Elinder, Gisela Nyberg

Purpose:

Involving parents in programs to prevent overweight and obesity in young children has proven to be effective. To improve such programs it is important to recognize parents' concerns regarding their children's health behaviors. The aims of this study were to describe parents' concerns about their children's diet and physical activity habits and to describe barriers to changing the habits.

Methods:

A qualitative design was used. Archival data was gathered unobtrusively in the form of memos taken after a session of Motivational Interviewing with Swedish parents as part of the parental support program A Healthy School Start. The-matic analysis was applied.

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Results:

Three overarching themes were identified regarding children's dietary habits: Amount of food consumed influenced by parents' and children's different behaviors, eating situations influenced by stressful everyday life and family interplay, and food choice influenced by stressful everyday life and family interplay. One overarching theme was identified regarding physical activity: Physical activity influenced by stressful everyday life and family interplay. Several parents emphasized that the concern did not constitute a problem in the family, but rather an adjustment.

Conclusions:

Family interplay appears to be an important link between the work-life stress perceived by parents and less healthy food and physical activity habits in the home. Family interplay should be addressed in future intervention studies on health-related behaviors of children.

P324

Influences on the diet quality of preschool children: Importance of maternal psychological characteristics

Authors:

Megan Jarman, Hazel Inskip, Georgia Ntani, Cyrus Cooper, Sian Robinson, Mary Barker

Purpose:

This study explored associations between maternal psychological factors and children's quality of diet.

Methods:

In a cross-sectional study of 348 mother-child pairs, mothers provided information on health-related psychological factors and aspects of the mealtime environment. The quality of children's diets was assessed using a validated food frequency questionnaire from which a standardised diet z-score was calculated. A high score described children with high consumption of vegetables, fruit, water and wholemeal bread, and low consumption of crisps, chocolate and low-calorie soft drinks. Cluster analysis was performed to assess grouping of mothers based on the following psychological factors: Perceived control, self-efficacy, well-being and food involvement. Mealtime characteristics and children's quality of diet were examined, according to mothers' cluster membership.

Results:

Two main clusters were identified. Mothers in cluster one had significantly higher scores for all psychological factors than mothers in cluster two (all $P < 0.001$). Clusters were termed 'more resilient' and 'less resilient' respectively. Children of mothers in the less resilient cluster ate meals sitting at a table less often ($p = 0.03$) and watched more television ($p = 0.01$). These children also had a diet quality score that was 0.61SD (95% CI -0.82, -0.40, $p < 0.001$) lower than children with mothers in the more resilient cluster. This association was attenuated, but remained significant after controlling for confounding factors, that included maternal education and home/mealtime characteristics ($p = 0.006$).

Conclusions:

Influences on young children's quality of diet are complex. This study suggests that mothers should be offered psychological support as part of interventions to improve children's quality of diet.

P325

Perception is not enough: Effects of young children's perceptions and concern of their weight and parental support on their physical activity and nutritional behaviors

Authors:

Lesley Cottrell, Christa Lilly, Samantha Shawley

Purpose:

The transition into middle school can change pre-teen physical activity (PA) and nutritional behaviors. Identifying factors that are based on child-report and contribute to behavioral improvements are needed to strengthen intervention programming. Children's perceptions of their weight, level of concern, and parental support may contribute to these disparities.

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Methods:

178 children (7-12 years; 44% female) participated in a cross-sectional, clinic-based study. A MANOVA was used to assess the effects of: 1) Child-described weight compared to age- and gender-appropriate peers; 2) level of concern about his/her weight; and 3) level of parental support. Study outcomes included child PA enjoyment, perceived level of PA compared to peers, PA in past 7 days; total servings of fruits/veg consumed per child report/day.

Results:

37.2% of children were overweight or obese; 15% perceived themselves to be overweight. 35% were concerned about their weight. Children who perceived themselves to be overweight reported higher fruit/veg consumption ($p < .001$). Those who were “a little” ($p < .001$) or “very” ($p < .001$) concerned about their weight consumed more fruits/veg, particularly those who thought they were overweight. Children who were “a little” concerned about their weight had the lowest PA ($p < .01$). Children who were not encouraged by their parents to be active had lower PA reports overall, regardless of BMI or the child’s perceptions of own weight.

Conclusions:

Children’s perceptions of their weight alone may not be enough to predict their PA and diet. Programs designed to raise children’s awareness and concern for their health may produce stronger behavior change.

P326

Associations between parenting practices and adolescent girls’ leisure-time physical activity

Authors:

Julie Saunders, Jo Salmon, Clare Hume, Alexandra Bremner, Anna Timperio

Purpose:

Parenting styles and practices are related to health outcomes among adolescents; however few studies have comprehensively examined the influence of parenting on physical activity (PA). This study examines associations between parenting and adolescent girls’ leisure-time physical activity (LTPA).

Methods:

Analyses are based on data collected in 2012 from 414 girls aged 12-16 years, residing in the Perth metropolitan area. Girls completed the International Physical Activity Questionnaire Adolescent version (IPAQ-A) and reported their mother’s and father’s PA parenting practices. Linear mixed models were used to estimate univariable associations between parenting practices and LTPA. Multivariable models were run for all factors relating to firstly, mothers, and secondly, fathers.

Results:

Univariable analyses indicated mothers’ provision of logistic support ($p < 0.001$), fostering healthy PA habits ($p < 0.001$) and expectations regarding PA ($p = 0.03$) were positively associated with LTPA. Fathers’ provision of logistic support ($p < 0.001$), fostering healthy PA habits ($p < 0.001$), PA modelling ($p < 0.001$) and expectations regarding PA ($p = 0.034$) were positively associated with LTPA. In the mothers’ multivariable model, provision of logistic support ($p = 0.001$), fostering healthy PA habits ($p = 0.05$) and expectations regarding PA ($p = 0.01$) remained significant, while forcing PA ($p = 0.04$) was negatively associated with LTPA. In the fathers’ multivariable model, provision of logistic support ($p < 0.001$) and expectations regarding PA ($p = 0.04$) remained significant.

Conclusions:

Adolescent girls’ perceptions of their parents’ PA parenting are clearly important for participation in LTPA. Further examination of PA parenting is essential to promote physical activity among this important target group. Future research should examine parental perceptions of PA parenting and consider other PA outcomes.

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P327

A qualitative analysis of the Rhode Island Expanded Food and Nutrition Education Program with regards to childhood obesity and chronic disease prevention

Authors:

Patrick van Asch, Kathleen Gorman, Kathleen Melanson, Linda Sebelia, Alison Tovar

Purpose:

To assess caregivers' perceptions of childhood obesity related behaviors discussed in the Rhode Island Expanded Food and Nutrition Education Program (EFNEP). In Rhode Island, 16% of children ages 2 - 4 are obese, which is higher than the United States population where 12% are obese.

Methods:

The EFNEP curriculum teaches 6 lessons and focuses on enhancing nutritional well-being. Sixty minute semi-structured interviews were conducted at local community centers with participants (n=22) who had completed the program. Participants were 18 or older and had a young child between ages 2 - 8 years. A translator was present for individuals communicating in Spanish. Interviews were transcribed verbatim. Content analysis will be utilized to analyze themes coded in NVivo.

Results:

Preliminary results indicate discussion on physical activity and screen time is lacking within the EFNEP curriculum; in particular there is need for more ideas on activities caregivers can do with their children. Caregivers setting limits around screen time was common; however, there were inconsistencies regarding the amount of time per day. Although caregivers appreciated the nutrition information provided during the program, they thought that parenting strategies on how to implement some of the knowledge acquired would be helpful.

Conclusions:

With the results, the current curriculum can be tailored for caregivers to ensure adequate discussion on obesity related behaviors. Given that EFNEP reaches a low-income, high risk population, prevention of overweight and obesity should be promoted among these caregivers.

P328

The Family Life, Activity, Sun, Heath, and Eating (FLASHE) study: A comprehensive approach to evaluating family dyads and their cancer prevention behaviors

Authors:

Linda Nebeling, April Oh, Heather Patrick, Frank Perna, Erin Hennessy, Amy Yaroch

Purpose:

The FLASHE study is designed to collect data in adolescents and their parents in multiple domains of environment and behavior, with a specific focus on family relationships. The FLASHE study will examine the correlates of obesogenic and cancer preventive behaviors among adolescents and their parents across intra- and interpersonal domains, including the community and home environment.

Methods:

The design of NCI's FLASHE study, a web-based survey, will be presented. The sampling design will select parent-adolescent dyads (n=2500) to collect data on multiple domains, including neighborhood/community and home environment, parenting relationships, psychosocial factors and behaviors. Accelerometers will be used to collect motion data from a subset of adolescents. A conceptual model was developed with constructs identified through a comprehensive literature review. Scientific conferences were held to review current research methodology. Opinion surveys with teams of scientific experts (n = 516) external to NCI were conducted in October 2011 to identify priority research areas and gaps. Cognitive testing was used to test and refine new questions developed for this survey.

Results:

The highest priority research domains identified in diet include: Home food, community and school environment; psychosocial correlates of dietary behaviors; and parenting styles and practices related to diet behaviors. In contrast, the

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highest priority research domains in physical activity include: Community environment with neighborhood access and policy influences; school and home environment; sedentary behaviors; and parenting styles and practices.

Conclusions:

These results strengthen the scientific purpose and survey goals of the FLASHE study.

P329

Should parents do sports in order to increase their children sports' participation?

Authors:

Cristina Padez, Daniela Costa

Purpose:

Improving physical activity (PA) levels is an important public health challenge when many young people are not meeting the guidelines of daily exercise. However, first we need to understand some factors responsible for children's PA.

Methods:

We interviewed 224 children (6-10 years-old) and applied a survey in their respective parents. The program SPSS 21 was used for statistical analysis.

Results:

Between the children observed, 69, 6% do some extracurricular sport but the mean of minutes per week is really low: 108, 33. Parental sport participation seems to be an important factor in children extracurricular sport participation. When the father claims to do sports there is a positive relationship in children sports' participation ($X^2=6,382$; $p=0,012$); but when it comes to the mother we found the inverse situation ($X^2=4,549$; $p=0,033$). Our hypothesis is that mothers who do not do sports have more time to take their children to extracurricular activities and use some other kind of motivation like praising their child efforts. However, between the children that already do sports we found that there are some parental factors acting as motivations for increasing children's PA levels, such as: If father ($t=2,291$, $p=0,23$) and mother ($t=2,643$, $p=0,009$) do sports and the time per week that father ($p=0,26$) and mother ($p=0,001$) spends doing exercise.

Conclusions:

We claim that family behavior play an important role in the athletic domain, particularly with younger individuals. In conclusion, parents should make an effort for acting as active role models when it comes to their children and physical activity habits.

P330

Feasibility of a telephone brief motivational enhancement intervention to reduce TV time aimed at parents of low income, Texas Rio Grande Valley 4th graders

Authors:

Kelli Drenner, Steven Kelder, Andrew Springer, Ross Shegog, Cristina Barroso, Carolyn Agurcia-Parker, Deanna Hoelscher

Purpose:

Reducing frequency of television viewing has been found to decrease childhood obesity. This feasibility study examines a parent-centered brief telephone-delivered Motivational Enhancement Interview (MEI) to encourage parents of 4th graders to set a rule limiting TV time to the American Academy of Pediatrics (AAP) recommended 2 hours per day or less. This sub-study was part of the larger CATCH: En Vivo pilot study conducted in a Hispanic population in the Texas Rio Grande Valley.

Methods:

Classrooms were matched and assigned to either the En Vivo intervention ($N=140$) or control condition ($N=123$). A subset of those in the En Vivo condition were contacted ($N=38$) via telephone. It was hypothesized that parents in the MEI condition would be more likely to set a rule limiting TV time. Unconditional logistic regression was used to analyze the data.

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Results:

At post-test, 85% of parents in the MEI group (compared to 71% at pre-test) reported having a rule limiting TV time. The adjusted odds ratio for the MEI group compared to the control group was 3.88, 95% CI (0.72-20.99). The proportions of parents having a rule about TV time for the control and En Vivo group at post-test were 63% and 65% respectively.

Conclusions:

MEI shows encouraging results. More parents in the MEI group set rules limiting TV time to the AAP recommendation compared to the En Vivo and control groups. MEI needs to be tested as a stand-alone treatment and is not ready for dissemination; however this study specifies effect sizes for study-planning.

P331

Working parents balancing priorities: Parental time demands, food and screen time strategies, and children's eating behaviors

Authors:

Anne Haase, Sally Culmer

Purpose:

Working parents experiencing time scarcity may use food and screen viewing strategies to manage a balance between work and family roles, potentially making more poor behavioral choices for their families. This study aimed to determine associations between working parents' time demands, food coping and screen viewing strategies and their children's eating behavior.

Methods:

Cross-sectional design; 53 parents of children aged 0-11 years completed measures on time demands, food coping strategies, screen viewing (SV) restriction, and their child's eating behavior. Correlation and regression analyses were used to determine contributions to parent-reported child's eating behavior.

Results:

Mostly mothers (84.9%) reported working flexible and part-time hours, with 73% using nursery care. Mothers' time demands were associated with reduced child healthy eating ($r = -.52$, $p < 0.01$), while mothers' food coping strategies contributed to children eating on their own ($\beta = -0.37$; $p = 0.01$). Greater child television time was associated with lower breakfast consumption ($r = -.42$, $p < 0.05$) and poorer overall eating behaviors ($r = -.45$, $p < 0.01$). Parental time demands ($\beta = -0.39$ $p = 0.03$) and restricting screen time ($\beta = -0.41$ $p = 0.03$) predicted poorer child eating behavior.

Conclusions:

Working parents' perceptions of time scarcity and demands may contribute to poorer child eating behaviors, suggesting time scarcity may be an important factor counterbalancing more positive determinants of change and may need to be considered when applying to current coping and behavior change models for improving eating behaviors within families.

Community Interventions Children Physical Activity & Nutrition

P332

Getting ahead by moving: The influence of a community-based physical activity summer program on youths' executive functions and BMI

Authors:

Amanda Ward, Amy Bohnert, Valerie Flores, Kimberly Burdette, Lara Dugas, Rebecca Silton

Purpose:

Obesity has reached unprecedented levels, and low-income, minority females have been disproportionately affected. New lines of research have proposed that the summer months represent a vulnerable period for not only weight gain

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and decreases in physical activity (PA), but also for learning loss and cognitive decline. Many laboratory-based studies have demonstrated relations between PA, overweight, and important aspects of cognitive functions including executive functions (EFs), but few studies have explored community-based programming, particularly as a strategy for promotion of adolescent physical and cognitive development. This study examined whether PA in the context of a community-based summer program is associated with improvement in EFs (e.g., shifting, inhibition, working memory) and BMI among a sample of urban minority girls.

Methods:

Participants (N =69) were 10-14 year old girls in a summer camp. Participants completed a multi-method assessment examining EFs, anthropometrics, and PA. EFs were measured through surveys and neuropsychological tests, PA through accelerometry and self-report, and anthropometric measurements were obtained to calculate BMI.

Results:

Findings suggest that girls who report more PA perform better on EF tasks. Additionally, girls who spent more time in moderate-to-vigorous PA had lower BMIs, and girls with higher BMIs reported more problems with EFs in daily life and had more difficulty completing tests of EFs.

Conclusions:

These findings highlight the impact of summer time on physical health and EFs, and results suggest the benefits of implementing PA interventions during this time. Findings may also inform health policy initiatives related to childhood obesity and summer learning loss.

P333

Comparative analysis of obesogenic context in CORD communities

Authors:

Rebecca Lee, Allen Hallett, Nathan Parker, Hanadi Rifai, Maria Modelska, Daniel O'Connor

Purpose:

The Childhood Obesity Research Demonstration (CORD) project is a multi-site initiative evaluating how linking public health and primary care interventions improves health and behavioral outcomes among children. We evaluated policies supporting physical activity (PA) and healthy eating (HE), access to parks and supermarkets and health norms of meeting PA, fruit and vegetable and healthy weight guidelines in CORD communities by racial/ethnic composition, youth population, and educational attainment.

Methods:

Sociodemographic, access, and health characteristics of the eight CORD communities were extracted from publically-available datasets. Communities were assessed for PA and HE policies using the CORD Policy Indicator Checklist (PIC). Factor analyses produced six PA and five HE policy components. Communities with low and high minority composition, youth population, and educational attainment were compared using t-tests on PIC principal component scores, access, and health norms.

Results:

Higher Hispanic composition was related to weaker nutrition standards and guidelines ($r=-0.741$). Higher youth composition was related to weaker outdoor and physical education (PE) standards ($r=-0.874$) and weaker policies on healthy food access ($r=-0.753$). Lower educational attainment was related to stronger community PA infrastructure policies ($r=-0.823$) and weaker policies on healthy food access ($r=0.730$). T-tests showed that communities with higher minority composition had weaker fitness testing and PE policies, stronger nutrition standards and guidelines, and improved supermarket access among low-income individuals. Communities with lower educational attainment showed higher rates of adult overweight (All $ps<0.05$).

Conclusions:

Efforts are needed to enhance policy supports in communities with higher proportions of minorities to improve PA and HE.

P334

Outcomes of Go4Fun: An up-scaled community-based child obesity treatment program

Authors:

Binh Nguyen, Blythe O'Hara, Debra Welsby, Louise Baur, Louise Hardy

Purpose:

The management of obesity across a population is challenging, requiring a tiered level of service delivery relating to the severity of disease. Community-based obesity treatment programs with a large population reach are an important part of this approach.

Methods:

Community-based child obesity treatment program delivered after-school (10-weeks, biweekly) across New South Wales, Australia, from 2009-2012. Participants were aged 7-13 years with a body mass index (BMI) ≥ 85 th percentile and no co-morbidities, and their parents/carers. Pre-post change in BMI, BMI z-score, waist circumference, waist-to-height-ratio (WtHtr), self-esteem, and weight-related behaviours (physical activity, screen time, diet). Analyses were adjusted for clustering and socio-demographic variables.

Results:

Overall, 2,499 children participated (54.8% girls; mean age [SD]: 10.2 [1.7] years) and 57.9% completed 75% of the program (56.8% girls). Significant changes post-program in children included reductions in BMI (-0.7 kg/m²), BMI-z-score (-0.12), waist circumference (-2.3 cm), and WtHtr (-0.02) (all $p < 0.001$). There were also significant improvements in self-esteem (+3.0 units), physical activity (+1.2 days/week), screen time (-4.9 hours/week), and the frequency of eating unhealthy foods (-3.1 units).

Conclusions:

This is one of the few studies to report on the findings of a government-funded, up-scaled program in real-world settings, and shows that investment in a community-based child obesity treatment program produces significant changes in weight and weight-related behaviors in the short-term. The findings support public health investment in a health priority area, and up-scaled community-based child obesity treatment programs as a promising adjunctive intervention to health service provision at all levels of care.

P335

Community-based child obesity treatment program: Dose-response association between attendance and anthropometric and behavior change

Authors:

Binh Nguyen, Blythe O'Hara, Debra Welsby, Adrian Buman, Louise Hardy

Purpose:

Go4Fun® is a multidisciplinary community-based child obesity treatment program (adapted from the UK Mind Exercise Nutrition Do it) disseminated across New South Wales (Australia). We examine the dose-response relationship between program attendance and change in children's weight and weight-related behaviors.

Methods:

Children aged 7-13yrs with a BMI ≥ 85 th percentile and no co-morbidities (n=2229) who participated in Go4Fun® (55.1% girls). Children's BMI, waist circumference, and fitness were measured. Parents completed a questionnaire on their child's physical activity, diet, screen-time and children completed a self-esteem questionnaire. Program attendance was recorded by facilitators at each bi-weekly session over 10-weeks.

Results:

Children attending 40-59% of sessions, >once/week experienced significant improvements in weight and all behavioral outcomes except self-esteem which significantly improved after >60-79% program attendance. Attending sessions $\geq 1-2/$

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week was associated with significant improvements compared with attending sessions <1/week (all $p < 0.001$). Greater benefits were derived from attending the majority of program sessions.

Conclusions:

To achieve optimal results in the Go4Fun® program children need to attend more than 60% of the sessions and more than one session a week. Participation between 40-59% still results in substantial benefits for the participants; however attendance at fewer sessions has little to no benefit to participants.

P336

Reducing child obesity at the population level: Outcomes of the “Good for Kids. Good for Life” child obesity prevention program

Authors:

John Wiggers, Luke Wolfenden, Karen Gillham, Andrew Colin Bell, Rachel Sutherland, Louise Hardy, Andrew Milat, Nicole Nathan

Purpose:

Good for Kids. Good for Life. (GFK) was a large-scale whole-of-community intervention conducted in the Hunter New England (HNE) region of NSW, Australia from 2006-2010 to reduce the prevalence of child overweight and obesity.

Methods:

Working in seven different settings including primary schools, childcare services, sports clubs, community services, GPs, health services and Aboriginal Health organisations the program adopted a capacity building approach to increase the ability of each setting to implement proven or promising programs that addressed the behavioral determinants of child overweight and obesity. Anthropometric data as well as dietary and physical activity behaviors of approximately 4000 children were collected at baseline and follow-up.

Results:

The study found an average annual rate of decline in the prevalence of overweight and obesity of approximately 1% per year for all children in the region. The prevalence of overweight and obesity decreased significantly for children in years K, 2 and 4 girls between 2007 (25.5%) and 2010 (18.1%). There were significant reductions in the proportion of children; consuming fruit juice, not doing any organised physical activity and exceeding screen time recommendations; and significant increases in the proportion of children; drinking 2+ cups of water per day, meeting fruit and vegetable and physical activity guidelines.

Conclusions:

The findings demonstrate the feasibility and effectiveness of a multi-setting capacity-building approach to improving the determinants of, and reducing the prevalence of child obesity at the population level.

P337

Sanos y Fuertes (Healthy and Strong): A culturally-tailored nutrition and health intervention

Authors:

Britt Rios-Ellis, Gail Frank, Natalia Gatlula, Selena Nguyen-Rodriguez, Melawhy Garcia-Vega

Purpose:

Latino children comprise 16.3% of the nation's population. In Long Beach, 68.2% of children are obese. To address Latino childhood obesity, a culturally-tailored nutrition and health curriculum was developed to improve nutrition, increase physical activity, and prevent overweight/obesity.

Methods:

The Sanos y Fuertes (Healthy and Strong) curriculum was developed using community based participatory research principles. Faculty and research staff, community health workers, and graduate students were linked to assist in formative data collection (e.g., focus groups, pilot testing). The intervention consists of a one 2-hour introductory session and one 4-hour educational session with three assessment points (pre, post, and 3 month follow up). Self-administered

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surveys measured knowledge of healthy habits, physical activity recommendations, and intention to change behaviors. Recruitment criteria included: (1) Parent of a child between the ages of 2 - 8, (2) being self-identified Latino, and (3) living in Los Angeles. Participants received grocery store gift cards worth \$30.

Results:

To date, 211 families have participated in the intervention. Preliminary analyses among participants completing assessments (N = 110) indicated significant increases in knowledge ($t(109) = 7.45, p < .001$), increases in vegetable intake for adults ($t(109) = 2.71, p < .01$) and children ($t(109) = 3.15, p = .001$) from pre to 3-month follow-up.

Conclusions:

Using CBPR, the Sanos y Fuertes intervention shows promise in increasing knowledge and behavior change in nutrition and physical activity leading to reduction in the prevalence of overweight and obesity among Latino families. Culturally-relevant research practices and strategies will be shared.

P338

Designing and testing the feasibility of a multi-level intervention to prevent and treat adolescent obesity in the pediatric primary care setting

Authors:

Lori Pbert, Monica Wang, Elizabeth Jackson, Susan Druker, Milagros Rosal

Purpose:

To design and evaluate the feasibility of a multi-level intervention targeting adolescent obesity in pediatric primary care settings.

Methods:

Focus groups with clinicians, adolescents, and parents (N=58) assessing perceptions of and receptivity to various intervention practices related to adolescent weight management were conducted. Findings informed the development and pilot-testing of a multi-level intervention (office systems, clinician-delivered counseling algorithm, and adolescent group sessions) targeting overweight and obese adolescents (N=22).

Results:

Adolescents and parents reported receptivity to clinician-facilitated discussions of adolescents' weight status, dietary, physical activity, and sedentary behaviors. However, clinicians reported several challenges in communicating and effecting obesity-related behavior change among adolescents. Families and clinicians agreed on the need for standardized systems addressing adolescent obesity and favored a family approach to support obesity-related behavior change. The pilot-study indicated feasibility of implementing office systems to support obesity treatment. Clinicians' use of a counseling algorithm was associated with increased frequency of discussion of weight status and related goals with adolescents and parents. Adolescents participating in the intervention reported dietary improvements and movement toward the action stage for decreasing sedentary behavior.

Conclusions:

Multi-level interventions that systematically screen for obesity and support clinicians in delivering counseling hold promise in the pediatric primary care setting.

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Ninos Sanos, Familia Sana: A community-wide childhood obesity prevention intervention

Authors:

Marcel Horowitz, Albert Aguilera, Judith Martinez, Catherine Lamp, Margaret Johns, Constance Schneider, Adela de la Torre, Lucia Kaiser

Purpose:

This poster will describe the approach utilized by a multi-disciplinary University team to set up a community-based, comprehensive, childhood obesity prevention program targeting a Mexican-heritage population. Funded by the United States Department of Agriculture and administered by the University of California, Niños Sanos, Familia Sana (Healthy Children, Healthy Family) is currently in its third year of implementation (out of 5 total).

Methods:

Utilizing the latest research in the fields of nutrition, physical activity, economics, parenting, youth development, education, community development, and Latino studies, researchers designed an intervention that will impact the lives of Latino children ages 3-8 in a small rural town in the Central Valley of California.

Results:

The intervention includes direct and indirect education of children, teachers, and parents using an extension model with community lay workers and educators. An environmental scan was done to evaluate possible improvements to the infrastructure. Three years of family education are planned to empower parents to make positive adjustments in their families' lives. Topics for family night education were chosen based on current priorities of community members, as identified by leading obesity researchers and include sugar-sweetened beverage consumption, fast food, parenting/feeding styles, healthy routines, fruits and vegetable consumption, physical activity, and sleep duration. Continual participant input is sought which informs the direction of the project and keeps it relevant to the mostly Spanish-speaking families.

Conclusions:

This is one of the most comprehensive interventions yet attempted in America and the structure should prove useful to others attempting to combat childhood obesity.

P340

A staged approach to addressing pediatric overweight and obesity in a clinic setting

Author:

Melawhy Garcia

Purpose:

This randomized control study aims to test the efficacy of a culturally and linguistically, evidence based intervention to lower body mass index (BMI) and promote weight management among overweight Latino children in San Diego, CA. The purpose of this presentation is to present the application of the Chronic Care and Obesity Care Models to the development and implementation of this study to effectively address this economically disadvantaged population.

Methods:

390 overweight children will be randomized to two study conditions: 1) Special Intervention (SI), and 2) Usual Care. The Special Intervention condition consist of a 6-month group based weight management program targeting pediatric patients and care givers (parent/guardian). Consistent with the Chronic Care and Obesity Care Models the intervention includes collaboration with clinical staff to provide participants and caregivers with clinical information, goal setting, self-management support, and follow-up to achieve optimal weight.

Results:

Through collaboration with the health clinic and the inclusion of various health organization strategies, intervention participants will receive culturally tailored physician assistance, health education, and follow-up. The comprehensive

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intervention will lead to families and physicians working in a proactive and collaborative approach to prevent childhood obesity.

Conclusions:

The staged approach of this study has potential to effectively prevent childhood obesity by facilitating behavior change to lower BMI. Primary health care providers play a critical role in providing screening and guidance to promote changes that in turn will lead to improved health outcomes.

P341

Title: A pilot study of a communication intervention on volunteer soccer coaches' RISE-enhancing behaviors and players' cognitions

Authors:

Paul Saville, Steven Bray

Purpose:

Participation in organized sports can be integral to attaining recommended levels of physical activity. Children's motivation to participate in sport can be affected by the feedback they receive the perceptions they develop regarding how others (e.g., coaches) view their abilities (relation-inferred self-efficacy [RISE]). Many developmental sport programs rely on volunteer parents as coaches. However, few volunteer coaches have received training in coach-athlete communication. The purpose of this study was to examine the effects of an intervention targeting coaches' use of RISE-enhancing feedback and players' RISE and self-efficacy beliefs.

Methods:

Four volunteer soccer coaches and 17 players (girls $n = 7$; Mage = 10 yrs) participated. Coaches took part in a 1-hr workshop on effective communication methods to develop athlete self-efficacy. Coaching behavior was measured via audio/video recordings during two practices separated by the workshop. Players' RISE and self-efficacy beliefs were measured immediately following each practice session.

Results:

Prior to the intervention, RISE-enhancing communication accounted for less than 1% ($M = .20 \pm .40$) of all coach-athlete interactions. However, that proportion increased to approximately 6% ($M = 5.82 \pm 6.46$) following the intervention. Although the change was not statistically significant ($p = .16$), the within-subject effect size was considerable (Cohen's $d = 18.42$). Players' scores for RISE and self-efficacy did not change significantly ($ps > .20$) following the intervention.

Conclusions:

Results show volunteer coaches may seldom engage in RISE-enhancing interactions with their athletes. Although preliminary, our findings show coaches can learn and enhance their use of RISE-enhancing feedback.

P342

Community partnering to encourage healthy beverage intake through child care

Author:

Anisha Patel

Purpose:

Although California requires all licensed child care facilities to serve low-fat milk and limit 100% fruit juice and make water readily accessible throughout the day, work is needed to ensure implementation of these best practices. In this presentation, we describe how a community-academic partnership is helping to translate evidence-based policy into practice within child care.

Methods:

We used a snowball sampling approach to recruit a community advisory board (CAB) to guide project development, implementation, evaluation, and dissemination. We conducted an assessment of beverage-related practices and policies in child care and at home via direct observations in child care, child care policy review, and parent and child care

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provider interviews. Informed by this needs assessment and CAB member input, we developed a healthy beverage intervention which we are pilot testing in four child care facilities.

Results:

The CAB, which represents diverse viewpoints from research, medicine, public health, child care, and advocacy, meets biannually and communicates via email regularly between meetings. The partnership between UCSF and the CAB has helped ensure that research is relevant to child care facilities and parents, has facilitated recruitment of child care facilities and collection of data, has expanded project grant funding, and has created work opportunities for local community members.

Conclusions:

A community-academic partnership can greatly facilitate translation of evidence-based policy into practice in community settings. The approach can also empower communities through job creation and skills development.

P343

Brighterbites project to increase food access and literacy: Design and implementation processes

Authors:

Jane Momoh, Shreela Sharma, Chris Markham, Lisa Helfman, Katherine Albus, Mike Pomeroy

Purpose:

To describe the design of a nutrition program to increase education and access to fresh fruits and vegetables (F&V), and create demand and intake of F&V using Community-based Participatory Research (CBPR) strategies.

Methods:

Brighterbites is a collaborative community-academic effort between the Houston Food Bank (HFB), Texas Children's Hospital, and the University of Texas at Houston School of Public Health. The 16-week program is uniquely designed to integrate literacy with access to fresh F&V to create demand for healthy food options in low-income communities. The brighterbites program repurposes donated produce from the HFB at a cost of \$0.04 per pound and participating schools infrastructures are used for weekly distribution of 30 pounds of food to families, which translates to a minimal cost of \$4.70 for F&V per family per week. The program also includes CATCH (Coordinated Approach to Child Health) a school-based nutrition and physical activity program, recipe demonstrations, and nutrition education for parents. A group-randomized design is currently underway to evaluate the program with a total of twelve schools (six intervention and six control, n=600) in the 2013-2014 and 2014-2015 school years in Houston, Texas.

Results:

Based on the design of the program, evidence-based strategies was used to develop an intervention directed towards elementary school students, parents, school administrators, and teachers to target increase F&V intake at school and home.

Conclusions:

By using donated food from the local food bank and existing infrastructures at schools, if found efficacious, brighterbites can be scaled and replicated in other cities and states.

P344

"With a little help from my friends": Preliminary results of an adolescent obesity management program focusing on the effect of the inclusion of peers on the intervention activities

Authors:

António Palmeira, António Quaresma, Liliana Falcato, Sandra Martins, Helena Fonseca

Purpose:

This study is a preliminary analysis of impact of the program "Tratamento da Obesidade Pediátrica" (TOP) on BMI, moderate-to-vigorous physical activity (MVPA), sedentary behavior (SB), and their association with peer support.

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Methods:

Fifty-seven obese adolescents (38 girls) participated voluntarily in a 12-month multidisciplinary program. The experimental group gathered participants that had one peer of their choice involved in the activities (n=29). The comparison group (n=28) gathered the adolescents that did not have a peer to escort them. The first 6- months data was collected using anthropometry, accelerometers and the POPS (peer support) questionnaire.

Results:

Both arms registered BMI z-score reductions ($p=.023$). The experimental group registered slight increases in MVPA and decreases in SB (non-significant). The comparison group registered non-significant decreases in MVPA and SB. The POPS' friends involvement dimension had decreased in the experimental group, while it increased in the comparison group ($p=.041$). The POP's autonomy support from friends dimension had a non-significant increase in the experimental group ($p=.131$). No associations were found among variables.

Conclusions:

According to these results, TOP has effectively reduced BMI z-score in both arms. These preliminary data suggest that PA levels might be increasing and SB decreasing in the experimental group. The findings related to the peer support dimensions might be explained, on one hand, because of the being preliminary nature of this data, and on the other hand, by the fact that once starting the program, adolescents from both arms benefited from reciprocal interactions.

P345

Key stakeholders' perception of major factors influencing childhood obesity and persisting gaps: A qualitative approach in two low-income communities

Authors:

Claudia Gehre, Alyssa Aftosmes-Tobio, Emmeline Chuang, Thomas Land, Kirsten Davison

Purpose:

Prior research has identified numerous factors contributing to increased rates of childhood obesity. However, few studies have focused explicitly on the experience of key stakeholders in low-income communities. This study sought to capture the perspectives of these on-the-ground experts regarding major factors contributing to childhood obesity as well as gaps in current prevention and control efforts.

Methods:

We analyzed 41 semi-structured interviews with key stakeholders from different community sectors (e.g., pediatric providers, childcare providers, teachers). Data were drawn from the Childhood Obesity Research Demonstration (CORD) project, a multilevel, multi-sector intervention designed to reduce childhood obesity being implemented in two low-income communities in Massachusetts. Interviews were conducted at baseline, transcribed, coded using grounded theory approach, and analyzed in NVivo 10.0.

Results:

At baseline, the vast majority of stakeholders had recently participated in obesity prevention strategies, and nearly all of them identified gaps in prevention efforts either within their organizations or in the broader community. In addition to factors that research has previously identified, several themes emerged, including the need to: Account for children's responsibility for feeding younger siblings; increase physical education and recess time; offer healthier snacks in schools and afterschool programs, and engage the whole community in prevention efforts.

Conclusions:

Community stakeholders can impact the success of interventions by bridging the gap between science and lived experience. The results of this study can guide future research by highlighting the importance of including stakeholders' frontline experiences with target populations, and using information on identified gaps to augment intervention planning efforts.

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Pilot evaluation of the Veggie Van program to increase access to fresh fruits and vegetables in lower-income and underserved communities

Authors:

Lucia Leone, Lindsey Haynes-Maslow, Stephanie Bomberger, Alice Ammerman

Purpose:

To conduct a pilot evaluation of the Veggie Van (VV), a mobile-market that brings weekly boxes of reduced-cost locally-grown F&V to lower-income communities and food deserts and offers cooking and nutrition education to customers. We evaluated changes in diet and attitudes among individuals at 3 sites (community college, lower-income housing, health department) in North Carolina.

Methods:

We conducted surveys just prior to the start of VV at each site and again at 3 months. F&V servings/day was computed using two measures: The National Cancer Institute's F&V Screener, a food frequency questionnaire (FFQ) with 12 questions including frequency and portion size and a 2-question item (2QS) asking participants how many F&V they typically ate each day over the past month.

Results:

At baseline, average servings/day of F&V was 4.7 (SD=2.6, n=66) based on the 2QS and 7.1 (SD=3.6, n=54) based on the FFQ. At follow-up, average servings/day for all survey participants decreased by -0.31 for the 2QS (p=0.34, n=58) and by -1.2 for the FFQ (p=0.03, n=48). However, using the 2QS, individuals who reported using the VV program frequently (n=32) increased their F&V consumption by 0.41 servings/day compared with a decrease of -1.19 for those who rarely/never used VV (n=26); a total difference of 1.6 servings/day (p=0.01). Frequent users reported additional improvements in other health behaviors and their ability to buy enough F&V.

Conclusions:

Offering weekly boxes of affordable F&V paired with education in underserved communities may improve F&V consumption for people who frequently use the program.

P438

Associated factors of physical education preference in Japanese adolescents

Authors:

Koji Yamatsu, Toshihiro Nakajima, Noriteru Morita, Masato Sagawa

Purpose:

In Japanese junior high school, physical education (PE) class is offered to improve adolescents' quality of life three-time 50-minutes every week. Adolescents' PE preference may be an important factor to stimulate their leisure-time physical activity. Therefore, the purpose of this study was to examine what factors were associated with PE preference in Japanese adolescents.

Methods:

Participants were 257 (female: 46.7%, mean body mass index [BMI]: 19.4+/-3.4) 1st grade students of public junior high schools near Sapporo area in Japan. All students and their parents completed the questionnaires. PE preference was defined as self-reported preferring to PE class. Achievement motivation scale (Horino, 1987) was used.

Results:

Among 257 students, 65.0% reported as preferring to PE class. PE preference was positively associated with achievement motivation score (Odds ratio [OR]=1.03, 95% confidence interval [CI]; 1.01-1.05). Using multiple regression analysis,

ses that controlled for several covariates (gender, BMI, household income, parents' education), relationship between PE preference and achievement motivation score was remained (OR=1.03, 95%CI; 1.01-1.05).

Conclusions:

Physical education preference was associated with more achievement motivation score in Japanese adolescents.

Acknowledgements: This study was supported by Challenging Exploratory Research (PI: Masato Sagawa) and Scientific Research C (PI: Koji Yamatsu) from Grants-in-Aid for Scientific Research in Japan.

Preschoolers Physical Activity & Nutrition

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Daily physical activity patterns and compliance with guidelines in preschoolers

Authors:

Susana Vale, Stewart Trost, Sandra Silva dos Santos, Jorge Mota

Purpose:

Regular physical activity (PA) in children is associated with improved health. The aims of this study were to describe the patterns of daily PA and to assess compliance with recommendations for total physical activity in preschool children.

Methods:

This study sample comprised 856 preschool children, aged 3 to 6 years. Children wore an ActiGraph GT1M accelerometer for 7 consecutive days. Children were classified as meeting or not meeting PA recommendations based on at least 3 hrs per day of total PA (TPA). Daily TPA was defined as the sum of light, moderate, and vigorous PA and was estimated using a count cut-point of ≥ 800 cpm, which corresponded to the lowest count rate recorded for slow walking.

Results:

The daily mean minutes of TPA were of 162min. Boys engaged significantly more than girls (boys - 170 ± 35 min vs girls - 153 ± 34 min, $p \leq 0.001$). In both sexes, sedentary behaviour accounted for the majority of daily time. The average proportions of time engaged in active activities were as follows: 13% non-locomotor activities, 8% in light locomotor activities, 7% in moderate intensity activities and 4% in vigorous intensity activities.

Overall, 29% of the sample met the TPA recommendation. Boys were significantly more likely to achieve 3 or more hours of TPA than girls (boys - 36,4% vs girls - 21,7%, $p \leq 0.001$).

Conclusions:

These findings suggest that only about 30% of children met current internationally recognized guidelines for physical activity in young ages. Therefore, early interventions are thus recommended.

P348

Disparities exist between the Australian Guide to Healthy Eating and the dietary patterns of Australian preschoolers

Authors:

Li Kheng Chia, Lesley MacDonald-Wicks, Alexis Hure, Tracy Burrows, Clare Collins

Purpose:

Dietary patterns track from childhood into adulthood with the preschool years important for the development of skills, knowledge and attitudes towards food. The 2013 update of the Australian Dietary Guidelines in 2013 included Australian Guide to Healthy Eating (AGHE) recommended daily food group servings for children aged 7 months to 3 years. The aim was to evaluate whether the dietary intakes of a sample of Australian pre-schoolers met the minimum AGHE recommended serves and the age-specific Nutrient Reference Values (NRVs). Data were from pre-schoolers aged two and three years ($n=54$) whose mothers were enrolled in the Women and Their Children's Health study, from the Hunter New

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England region of New South Wales, Australia in 2006. Dietary intakes were reported by mothers using a food frequency questionnaire. T-tests were used to determine differences between food group intakes and the AGHE. None of the pre-schoolers achieved AGHE recommendations for all food groups, with majority below recommendations for bread and cereals, vegetables, and meat/alternatives. The average macronutrient distributions (% carbohydrate, protein, fat) were within the acceptable range with 96% exceeding saturated fatty acid recommendations. NRV's for selected nutrients could be met daily by consuming significantly higher servings of fruit, dairy, and discretionary choices, and significantly lower servings of breads and cereals, vegetables, and meat compared to the AGHE. Dietary patterns of these Australian pre-schoolers do not align with the current AGHE. Alternate eating patterns informed by population cohort studies could be used to provide greater diversity in food group national recommendations.

P349

Use of musical narratives to increase young children's singing about healthful food and physical activity at home

Authors:

David Dzewaltowski, Tanis Hastmann, Bronwyn Fees, Terri Holmberg, Michaela Schenkelberg, Richard Rosenkranz

Purpose:

Social narratives have been effective at influencing behaviors in children with social delays. We describe and provide a preliminary process evaluation of a novel intervention strategy described as musical healthful food and physical activity narratives.

Methods:

Childcare staff trained in HOP'N Home provided 12 weeks of curricular activities to develop young children's asking skills. As children learned about "Go" and "Slow" foods, physical activities and advertising, they learned three musical narratives to model and rehearse asking about healthful choices in the following social situations: Play, breakfast, and watching TV. For example, the "Go and Slow" song's chorus was "Is it a go, is it a slow, is it healthy yes or no?" "Remember to ask the question!" Teachers encouraged children to sing the songs, and song lyrics and a CD were sent home to parents.

Results:

Seventy-eight percent (n=109) of parents of study participants attending twelve childcare intervention sites (ages 2.5 to 5 years; 60% male; 31.5% overweight/obese) completed a post intervention process survey. Parents reported that they received the CD from the childcare center (85%) and listened to the CD at least once (74%), > 1 times/wk (37%), and > 3 times/wk (13%). Parents also reported whether their child sang the song at least once (81%), > 1 time/wk (63%) and > 3 times/wk (42%).

Conclusions:

Musical narratives learned in the childcare setting were sung at home by a majority of children. This strategy shows promise as a method to build the capacity of children to reach parents.

P350

Obesity prevalence declines among kindergarten students in a rural midwestern community

Authors:

Kate Hannon, Kate Heelan

Purpose:

National initiatives have drawn attention to childhood obesity among 2-5 year old children by building awareness and creating standards. Between 2008-2011 a small, but significant, decline in obesity among low-income preschoolers was found in 19 of 43 US states (May, et al., MMWR 2013). Our purpose was to evaluate the prevalence of obesity among children entering school from 2008-2013.

Methods:

Body mass and stature were measured on a sample of 2,683 kindergarten students, age 6.01 ± 0.1 years, enrolled in a rural Midwestern US school district between the years 2008 and 2013. Five of the nine schools had over 40% of students

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receiving free or reduced federal meals; the threshold for Title 1 (T1) designation. BMI percentiles were calculated using the gender specific BMI-for-age percentiles (CDC). Repeated measures ANOVA examined differences of obesity prevalence for kindergartners between 2008-2013 and between T1 (n=1,752) and non-T1 (n=931) schools.

Results:

In 2008, 14.0% of children enrolling in kindergarten were obese (14.96% T1 and 12.31% non-T1). In 2013, the prevalence of obesity decreased to 7.06%, with only 8.88% of kindergarten students entering T1 and 5.48% entering non-T1 being obese.

Conclusions:

In a rural Midwestern US school district the prevalence of obesity decreased significantly among students entering kindergarten from 2008 to 2013. The decline was present in low-income children as well as higher SES children. Preventative programs and initiatives for preschool-aged children should be a continued focus.

P351

Conditioned to eat while watching TV? Low-income caregivers' perspectives on the role of television and snacking behaviors among preschoolers

Authors:

Rachel E. Blaine, Jennifer Orlet Fisher, Christine E. Blake, Nicholas Younginer, Alexandria Orloski, Claudia Gehre, Yasmeen Bruton, Kirsten K. Davison

Purpose:

Television (TV) viewing among children is suspected to contribute to obesity, in part, by stimulating eating. The interplay between TV viewing and eating, however, is not well-described. This research examines contextual influences surrounding TV viewing and snacking among preschool-aged children from low-income families.

Methods:

We conducted semi-structured interviews with 46 low-income White, African American, and Hispanic primary caregivers of children aged 3-5 years regarding feeding practices around child snacking. Interviews were transcribed, double coded using constant comparative methods, and summarized into themes using NVivo 10.

Results:

TV viewing was described in the context of child snacking, without prompting, by most participants across racial/ethnic groups, with White caregivers discussing television's role most frequently. Caregivers described situations in which eating co-occurred with TV for non-nutritive reasons. There's really no nutrition, but it keeps her occupied," and it's almost as if he's conditioned to watch TV and eat." Most caregivers described home environments highly conducive to "snack-TV time" identifying specific child-sized tables, chairs, or bowls used only for snacking in front of the television. Although some parents expressed concern regarding children's inattentiveness and risk of overeating while watching television, others identified TV viewing as a beneficial distraction for picky eaters. "I have him enjoying the cartoons as well as getting some nourishment."

Conclusions:

These qualitative findings suggest TV viewing and snacking may frequently co-occur among low-income preschoolers. Research is needed to understand the extent to which snacking among young children during TV viewing occurs outside of hunger and represents a learned behavior.

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P352

Is a burger a snack? Conceptualization and nutritional value of foods identified as snacks among low-income caregivers of preschool-age children

Authors:

Nicholas Younginer, Christine Blake, Kirsten Davison, Alex Orloski, Rachel Blaine, Claudia Gehre, Rachel Adler, Jennifer Orlet Fisher

Purpose:

Snacks are typically self-defined in epidemiological surveys, but little is known about how parents conceptualize children's snacks. This research used schema theory to evaluate parents' categorization and nutritional quality of snack foods commonly consumed by children.

Methods:

Fifty-five low-income White, African-American, and Hispanic primary caregivers of children aged 3-5 sorted 65 cards with images of foods commonly consumed by children into three categories: "snacks", "foods eaten outside of meals" (but not considered by the participant to fit into the snack category), and "non-snacks". Participant agreement (low<25%, moderate 25-74%, and high>75%) was calculated for the foods placed in each category. Average solid fats and added sugar (SoFAS: Equivalents per 100g) content of foods in each category was compared within and across racial/ethnic groups.

Results:

Eight foods were consistently categorized as snacks by at least 50% of participants across race/ethnicity including fruit, cookies, chocolate, and savory chips. Classification of other foods varied. Hispanics had greater agreement about types of foods identified as snacks (84% of cards moderate/high) versus Whites (78%) or African-Americans (71%). Whites had greater agreement among foods eaten outside of meals (82% of cards moderate/high) versus Hispanics (28%) and African-Americans (12%). Average SoFAS values of foods identified as snacks were consistently lower (range: 5.6- 6.7) than foods eaten outside of meals (range: 6.7-7.6) or non-snacks (range: 7.4-8.3).

Conclusions:

Children consumed high SoFAS foods outside of meals but these foods were not conceptualized as snacks by parents, raising questions regarding how these foods count within children's total intake.

P353

Developmental aspects of preschoolers' exploratory eating behaviors, food refusal and food preference

Authors:

Susan L Johnson, Patricia Davies, Richard Boles, William Gavin, Laura Bellows

Purpose:

Understanding the developmental timecourse of food acceptance patterns is critical for improving children's food intake. The Colorado LEAP Study is designed to measure young children's eating behaviors over a 3 y period.

Methods:

Preschoolers (n=136 intervention, n=100 control; 55.8 ± 4.7 mo) were assessed at baseline and post-intervention for their willingness to try 9 foods (beets, couscous, grapefruit, Gouda cheese, jicama, pineapple, salmon and spinach). Children's preferences and the behaviors they used to explore food (smell, lick, spit, swallow) were measured. Children's food refusals, affective ratings of foods, and the frequency of behaviors displayed were computed pre- and post-intervention. The prevalence of exploratory behaviors pre-to post-intervention was analyzed by Chi squared tests and associations among exploratory behaviors, children's food refusals and ratings of foods were assessed by PROC GLM using SAS v9.4.

Results:

Participants included 236 children (55% female, 44% Hispanic, 55.8 ± 4.7 mo). Nearly 1/2 of children refused at least 1 food at baseline (49%); at post-intervention refusals significantly decreased in both intervention (I) and control (C) groups (23% and 33%, respectively). About 63% of children used ≥1 exploratory behaviors at baseline and behaviors

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decreased significantly in both groups post-intervention ($I=31\%$ and $C=40\%$, respectively). Children's food refusals were associated with exploratory behaviors, particularly smelling food ($r = .27$, $p<.001$). As use of behaviors increased, children's affective ratings for foods decreased ($p<.001$) both pre- and post-intervention.

Conclusions:

Children's use of exploratory behaviors is related to food rejection and negative affective reactions to foods and declines over time.

P354

Comprehensive changes in school environment, health education, and teacher modeling led to healthier obesity-related diet and physical activity behaviors in preschool children

Authors:

Allison Lenkerd, Christine Blake, Scotty Buff

Purpose:

The Meeting Street Academy-Junior Doctors of Health© program reflects a collaboration between a comprehensive obesity prevention program and a rigorous, college-preparatory school serving low-income children. This initiative targeted children's obesity risk through school environment changes, health education, and teacher modeling. The study assessed program impact on children's nutrition knowledge, diet and physical activity (PA) behaviors, and BMI.

Methods:

Teachers, administrators, and parents ($n=77$) completed surveys on children's diet and PA environments at baseline and follow-up. Additional data were collected on all preschool children ($n=32$) at baseline, mid-year and follow-up to assess nutrition knowledge (individual interviews), dietary intake (3-day plate-waste observations of school snacks and meals), and PA (accelerometers in school for 5 days). Child height and weight were collected at baseline and follow-up.

Results:

There were no significant changes in nutrition knowledge. Boys' total kcals decreased ($p\leq0.05$). Boys' and girls' percentage of kcals from carbohydrates, fat, and saturated fat increased ($p\leq0.01$) and percentage of kcal from protein decreased ($p\leq0.000$). Intake of added sugars (gm) and calcium (mg) decreased ($p\leq0.01$) while total fiber (gm), sodium (mg) and iron (mg) increased ($p\leq0.000$). Boys' and girl's sedentary minutes decreased ($p\leq0.00$) and minutes spent in light/moderate and vigorous activity increased ($p\leq0.01$). There was a significant increase in boys' ($p\leq0.05$) and girls' ($p\leq0.01$) BMI-for-age percentile at follow-up.

Conclusions:

Comprehensive changes in the school environment, inclusion of health education sessions, and teacher modeling led to meaningful changes in obesity-related diet and PA behaviors in this high-risk population, potentially reducing these children's future risk of obesity.

P355

Preschool children at risk for obesity: The mediating effect of child behavioral and emotional functioning on sleep behaviors

Authors:

Richard Boles, Thrudur Gunnarsdottir, Susan Johnson

Purpose:

Sleep quality and duration have been related to obesity risk for preschool children, though few studies have identified causal factors related to poor sleep. This study evaluated the impact of child and family functioning on sleep behaviors within low-income minority families who are at risk for development of obesity.

Methods:

Families ($n=46$) of preschool aged children attending Head Start programs were recruited for home visitations to complete questionnaires on child health behaviors and family functioning. Mothers completed a demographic form, the

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BASC-2 (Behavioral Assessment System for Children) 30-item screener for child behavioral and emotional problems, the Children's Sleep Habits Questionnaire (CHSQ) (33 items), and the Confusion, Hubbub, and Order Scale (CHAOS) utilizing 15 items to assess home disorganization and family functioning. Parents and children were objectively measured for height and weight.

Results:

Mothers [mean age=31.2 years (7.2); BMI=30.1 (7.6)] were predominately Hispanic (67%; African American=33%), reported low education (59% high school degree or less), and annual income less than \$20,000 (78%). Preschool children (50% female; Mean age=56.5 months (7.6) were generally healthy weight (24% overweight/obese). BASC-2 ($\beta=0.43$, $p<.005$) and CHAOS ($\beta=0.66$, $p<.001$) predicted bedtime resistance, while BASC-2 significantly mediated the effect of CHAOS on bedtime resistance (Sobel $Z=2.8$, $p<.005$), accounting for 44.6% of the direct effect.

Conclusions:

Preschool children who are at risk for behavioral and emotional problems were linked with problematic sleep behaviors, after accounting for poor family functioning. Obesity interventions aimed at improving child sleep may benefit from targeting child behavioral and emotional functioning and family disorganization.

P356

Impact of increasing servings of vegetables and whole grains on individual nutrients packed in preschoolers' sack lunches

Authors:

Maria Jose Romo Palafox, Sara J. Sweitzer, Cynthia Ruth Roberts-Gray, Deanna M. Hoelscher, Margaret E. Briley

Purpose:

This study used data from two pilot studies of the Lunch is in the Bag behavior change intervention to evaluate changes in energy, dietary fiber, vitamins and minerals. Frequency and mean grams packed of vegetables and whole grains were determined to evaluate commonly packed foods that could be considered sources of nutrients for preschoolers.

Methods:

Three-day food records were analyzed using Food Intake Analysis System (FIAS) to determine amounts of nutrients packed. Hierarchical Linear models were used to examine intervention effects. Nutrients were adjusted for energy by nutrient-residual model.

Results:

Contents of children's sack lunches ($n=734$) were observed at baseline ($n=362$) and six weeks later ($n=372$). A significant increase in servings of vegetables (.024, $p<0.001$) and servings of whole grains (0.52, $p<0.001$) and 1 gram of dietary fiber ($p<0.001$) was observed. No significant impact was observed for other nutrients. Most frequently packed vegetables provided sufficient vitamin A for preschoolers, and included carrots, tomatoes, string beans, broccoli, corn and cucumbers with a mean baseline serving size of 33 grams. Most frequently packed whole grains were bread, granola, cereal bars, crackers and cheerios. Mean baseline serving was 54.1 grams and provided adequate iron and magnesium. Additionally, Cheerios provided sufficient thiamin, riboflavin, niacin, folate, vitamin B-6 and B-12 for a preschooler's lunch.

Conclusions:

Despite an increase of servings of vegetables and whole grains the nutrient profile of children's lunches was not significantly enhanced. Behavior-based interventions should include messages that promote lunches with adequate amounts of nutrients and recommended food group servings.

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P357

Efficacy trial of Lunch is in the Bag to positively change preschool parents' lunch packing behaviors

Authors:

Sara Sweitzer, Nalini Ranjit, Margaret Briley, Maria Jose Romo Palafox , Cindy Roberts Gray, Courtney Byrd-Williams, Deanna Hoelscher

Purpose:

Data from the efficacy trial for the Lunch is in the Bag behavior change intervention implemented in Early Childhood Education Centers (ECECs) were examined to evaluate changes in servings of fruit, vegetables and whole grains parents packed in sack lunches for their preschool child.

Methods:

30 Texas ECECs requiring parents of preschoolers to pack lunch were randomly assigned to intervention and control. Packed food items were observed and recorded on 2 nonconsecutive days at baseline and at 6 weeks, following the implementation of 5 weeks of Lunch is in the Bag at intervention centers. Changes in servings of vegetables, whole grain, and fruit packed were modeled using hierarchical linear regressions that included a random effect at the ECEC level, and adjusted for age and sex.

Results:

607 children (47% female; 55% in intervention centers) provided a total of 2440 lunch observations (1265 at baseline, 1175 at follow up). Results showed significant increases in the intervention group relative to the control group in both whole grain servings ($\Delta = .25$ (SE=0.12); $p=0.0317$), and vegetable servings packed ($\Delta = 0.17$ (SE=0.04); $p=.0001$). Average servings at follow-up at intervention centers were 1.61 fruit, 0.99 whole grain, and 0.54 vegetables.

Conclusions:

Lunch is in the Bag was effective in increasing parent packing of whole grains and vegetables, but more ways to increase vegetables servings in young children's lunches need to be identified.

P358

Child snacking contexts and purposes and their associated nutritional quality among low-income caregivers of preschoolers

Authors:

Christine E. Blake, Nicholas Younginer, Jennifer Orlet Fisher, Rachel E. Blaine, Alexandria Orlaski, Rachel Adler, Yasmeen Bruton

Purpose:

This research used schema theory to examine caregivers' reasons or purposes for feeding children snacks, the contexts in which they are provided, and the nutritional quality of snacks by those attributes.

Methods:

Card sorts were used with 55 low-income White, African-American, and Hispanic primary caregivers of children aged 3-5 years. Participants sorted 65 cards with images of foods commonly consumed by children separately by purpose and context. Participant agreement for the types of foods placed in each category was calculated. Mean solid fat and added sugar (SoFAS; equivalents per 100 g) content were compared across caregiver race/ethnicity and purpose and context categories.

Results:

Caregivers had low agreement within and across racial/ethnic groups about foods included in most context and purpose categories. Agreement was highest among snacks provided at home. Child snacking contexts included home, out/car, school/daycare, recreation, grandparent, family/friends, and restaurant. Highest SoFAS snacks were given in restaurants ($M=10.2/100\text{gm}$), with family/friends ($M=7.7/100\text{gm}$) and grandparents ($M=7.4/100\text{gm}$). Lowest SoFAS snacks were given in school/daycare ($M=5.0/100\text{gm}$), home ($M=6.2/100\text{gm}$), and out/car ($M=6.6/100\text{gm}$). Snack purposes included reward, child request, hunger, hold the child over, behavior-management, routine, health, special-occasion,

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playing, and treat. Highest SoFAS snacks were given for a special-occasion ($M=11.0/100\text{gm}$), treat ($M=10.1/100\text{gm}$), reward ($M=8.7/100\text{gm}$), and holdover ($M=7.9/100\text{gm}$). Lowest SoFAS snacks were given for health ($M=4.3/100\text{gm}$), routine ($M=4.6/100\text{gm}$), and hunger ($M=5.7/100\text{gm}$).

Conclusions:

The nutritional quality of snacks offered to young children varied by the social and culturally determined contexts in and the purposes for which they were offered.

P359

From policy to practice: Motivators, facilitators and barriers for the use of responsive feeding in Head Start and childcare programs

Authors:

Dipti Dev, Katherine Speirs, Brent McBride

Purpose:

National childhood obesity prevention policies recommend that responsive feeding (helping children eat according to their internal hunger and fullness cues) be required in childcare settings. Research supports the presence of self-regulation capabilities in young children and responsive feeding reinforces children's continuing ability to self-regulate their energy intake. Yet, evidence suggests that most childcare providers do not practice responsive feeding. This qualitative investigation presents motivators, facilitators and barriers for practicing responsive feeding from the perspective of Head Start, Child and Adult Care Food Program (CACFP) funded and non-CACFP providers.

Methods:

Providers were sampled using maximum variation purposive sampling. Semi-structured interviews were conducted until saturation was reached. Thematic analysis and constant comparison were used to derive categories and sub-categories using NVivo 9 software (QSR International).

Results:

Providers were motivated to practice responsive feeding because they felt it created pleasant mealtimes, helped children try new foods and prevented obesity. Facilitators included monitoring, vocabulary building to identify children's hunger and satiety cues, knowledge about CACFP portion sizes, and belief that children can self-regulate caloric intake. Barriers included providers' perceptions that children cannot self-regulate intake and making seconds available is expensive as well as providers' inability to identify children's hunger and fullness.

Conclusions:

Providers refrained from allowing children to decide how much to eat, because of their belief that children will not know if they are hungry or full. Educating providers about children's ability to self-regulate energy intake and strategies for identifying their hunger and fullness cues may help implement responsive feeding in childcare.

P360

Dietary intake in the home environment of children who attend full-time child care

Authors:

Shannon Looney, Jane Khoury, Kristen Copeland

Purpose:

Preschool children in full-time child care consume 50-75% of their daily energy requirements (1300 kilocalories) in this setting. While child care centers plan meals to meet these energy needs it is less clear what these children consume at home. We hypothesized children may consume excess energy in their home environments.

Methods:

Secondary analyses of parent-reported food records of 323 children (4.4 ± 0.06 years; 42.9% female; 39.3% black; 63.7 ± 1.8 BMI percentile) from 30 child-care centers. Dietary intakes from center pick-up time to bedtime (4.6 ± 0.1 hours)

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were analyzed using NDS-R software. General linear models with child-care center as a random effect were used for statistical analysis and least square means with standard errors reported.

Results:

Between pick-up and bedtime, children averaged 2.4 ± 0.1 eating occasions and 683 ± 17.5 kilocalories. Based on US Dietary Guidelines' servings, children consumed 0.6 ± 0.06 fruit servings, 0.6 ± 0.04 vegetable servings, 0.6 ± 0.04 dairy servings, 0.3 ± 0.04 100% juice servings, 0.4 ± 0.04 sugar-sweetened beverage servings, and 0.9 ± 0.07 energy-dense snack food servings. Energy intake was significantly ($p < 0.001$) associated with servings of fruits, vegetables, dairy, 100% juice, sugar-sweetened beverages, and snacks in the anticipated direction. Gender and time between pick-up and bed time were also significantly ($p < 0.05$) associated with energy intake. BMI percentile was not significantly associated with any variables.

Conclusions:

Children in full-time child care appear to consume a surplus of energy, of potential lower nutrient value, in the home environment.

P361

What guidance do childcare centers give parents about packing for their preschoolers? A content analysis of documentation given to parents

Authors:

Courtney Byrd-Williams, Janis Valmond, Naomi Chen, Sara Sweitzer, Shreela Sharma, Deanna Hoelscher

Purpose:

Preschool children consume up to two-thirds of their daily intake in childcare. Increasingly, centers are asking parents to pack their children's lunches, and little is known about the guidance childcare centers give to parents about packing lunch. This study analyzes the content of the documentation centers give to parents about packed lunches.

Methods:

We collected documentation (e.g., parent handbooks) from 36 Texas childcare centers that require parents to pack lunches for their preschoolers. In our quantitative content analysis, conducted by two independent coders, we iteratively identified nine coding schemes related to the guidance centers gave to parents about packing lunch.

Results:

Over 90% ($n=33$) of centers provided some lunch packing guidance; the strength of the language used ranged from suggestions to prohibitions. Four centers (11%) encouraged parents to send nutritious lunches, without discouraging or forbidding any foods. Twenty-seven centers (75%) forbade specific foods or food types (e.g., salty snacks). Gum, candy, and soda were the most frequently forbidden items. Twenty-three centers (64%) provided suggestions of what to pack, and suggestions varied greatly. Examples ranged from suggesting specific foods (e.g., sandwiches, 100% fruit juice, etc.) to centers specifying that lunches should include one food from the four food groups ($n=6$). Other coding schemes included wording related to food allergies, religious restrictions, and choking hazards.

Conclusions:

Lunch-packing guidance varies greatly across centers that require parents to pack lunch. Future research should investigate how such guidance is enforced and whether it influences what parents pack in preschoolers' lunches.

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P362

Association between teacher behaviors at lunchtime and preschool children's dietary intake

Authors:

Kristen Copeland, Jane Khoury

Purpose:

Best practices for obesity prevention, based on limited empirical evidence, suggest teachers should sit with children at meals, model and discuss healthy eating behaviors, allow children to self-serve, and determine if children are still hungry before serving seconds. We aimed to determine the association of these behaviors with children's dietary intake.

Methods:

Trained researchers observed lunches on 2 consecutive days in 30 child-care centers (n=60 lunches, n=343 preschoolers). NDSR was used to quantify energy and servings of fruits and vegetables consumed. General linear models with child care center as a random effect were used to evaluate the effects of teacher behaviors on children's intake.

Results:

In centers that allowed children to self-serve (11%), children consumed an average of 294 kcal, compared to centers where staff served (72%) and where parents provided food (16%) (353 and 415 kcal, respectively). Teachers sitting with children for most of the meal (12%) was associated with lower children's vegetable intake (0.2 v. 0.4 servings); teachers eating some of same foods (13%) was associated with higher vegetable intake (0.5 v. 0.3 servings). The remaining best practices were not significantly associated with energy, fruit, or vegetable intake: Encouraging trying new foods (77%), discuss healthy foods (33%), try to determine hunger before serving seconds (0%). Staff gave children seconds without children asking in 35% of centers.

Conclusions:

With exceptions of allowing children to self-serve and teachers modeling healthy eating, we did not find teachers' mealtime comments/behaviors to have significant impact to children's caloric, fruit or vegetable intake.

P363

Predictors of diet quality among Australian preschool children

Authors:

Laura Collins, Kathleen Lacy, Karen Campbell, Sarah McNaughton

Purpose:

Little is known about the predictors of diet quality among young children. This study examined the predictors of diet quality among a sample of preschool children.

Methods:

Secondary analyses of longitudinal data from The Melbourne INFANT Program were performed. Children's diet quality was measured using an adapted 12-component version (maximum score of 85 indicates compliance to all component recommendations) of the Revised Children's Diet Quality Index (RC-DQI) using data from multiple 24-hour dietary recalls collected when children (n=244) were aged ~3.5 years. Guided by ecological systems theory, multiple potential predictors of diet quality were considered, including child factors (sex, age of introduction to solids, breastfeeding status) and parental factors (nutrition knowledge, self-efficacy, modelling, home food availability, education) measured when children were aged 3, 9 and 18 months. Relationships between predictors and diet quality were assessed using univariate logistic regression and multivariable logistic regression controlling for age, BMI z-score and energy intake.

Results:

RC-DQI scores had a mean (SD) of 62.8 (8.3). Less than 20% of children met recommendations for five RC-DQI components (linoleic acid, alpha linolenic acid, grains, vegetables, television/energy intake interaction). Regression analyses

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showed that breastfeeding (OR:3.09; 95%CI:1.63, 5.85; $p=0.001$) and modelling (OR:2.01; 95%CI:1.04, 3.88; $p=0.037$) were associated with higher odds of having better diet quality even after including covariates.

Conclusions:

Diet quality of Australian preschool children remains suboptimal. The findings that breastfeeding and modelling of healthy eating were predictive of better diet quality confirms the importance of focussing on public health strategies that support these behaviors.

P364

Relationship between temperament and physical activity on preschoolers

Authors:

Sara King-Dowling, Nicole A. Proudfoot, Natascja D'Alimonte, John Cairney, Brian W. Timmons

Purpose:

To determine if parent-rated temperament characteristics of preschool children are related to objectively measured physical activity levels.

Methods:

Four-hundred and nineteen typically developing 3- to 5-year olds participated (208 girls; age: 4.5 ± 0.9 years). Parents filled out the Very Short Form of the Children's Behavior Questionnaire (CBQ). The CBQ consists of 36 questions divided into 3 temperament dimensions: Surgency, effortful control, and negative affect. Scale scores for each dimension were calculated as the mean score of all scale items applicable to the child. Physical activity was measured using accelerometers set to collect data over 3-second epochs for 7-days. Only children who wore the accelerometer ≥ 10 hours on ≥ 3 days were included in the analyses. Activity was analyzed for average minutes of moderate-to-vigorous physical activity (MVPA) per day. Pearson's correlations were conducted to determine relationships between behavioral measures and MVPA. Linear regression modeling was used to calculate the predictive power of each scale, adjusting for age and sex.

Results:

Children's surgency behaviour was positively correlated with MVPA ($r=0.252$, $p<.001$), while effortful control was negatively correlated with MVPA ($r=-.162$, $p=.002$). Negative affective behaviour was not related to MVPA ($r=.033$, $p=0.534$). After adjusting for age and sex, surgency behaviour was the only scale that significantly predicted MVPA (R^2 change = .042, $p<.001$).

Conclusions:

Preschool children's surgency behavior is correlated with objectively measured MVPA levels. Although surgency behavior may increase the risk of externalizing problems later in childhood, the concomitant increase in MVPA may provide fitness and health benefits.

P365

Characterization of preschoolers' active play opportunities at child care

Authors:

Pooja Tandon, Brian Saelens, Dimitri Christakis

Purpose:

To examine opportunities for physical activity (PA) at child care and how they relate to the amount and intensity of PA.

Methods:

44 children (mean age 4.1 yrs, 57% girls) from 5 centers wore accelerometers and were observed for average 7.6 hours/day (total 29 days). Observers coded activities into: 1) Not an active play opportunity, 2) nap time, 3) APO_outdoor free play, 4) APO_outdoor teacher-led, 5) APO_indoor free play, and 6) APO_indoor teacher-initiated. Accelerometer data was scored as sedentary, light, and moderate-to-vigorous.

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Results:

Overall children's activity levels were 73% sedentary, 12% light and 14% MVPA. Mean MVPA was 52 minutes/day with 20% attaining > 60 minutes/day. For 68% of the child care day children were not offered active play opportunities and 19% of time was naptime. 44 minutes/day were active play opportunities. Of this, 0.4% of time was teacher-led outdoor play (34% sedentary, 14% light, 53% MVPA); 6.9% time outdoor free play (39% sedentary, 18% light, 43% MVPA), 3.6% time indoor teacher-led active play (56% sedentary, 14% light, 30% MVPA); 3.2% time indoor active free play (33% sedentary, 17% light, 50% MVPA).

Conclusions:

87% of child care time was not an opportunity for active play, so it is not surprising that children are sedentary for >70% of time. Teacher-led outdoor activities had the greatest intensity PA but constituted a small proportion of time. Strategies to increase PA at child care should include decreasing expectations for sedentary activities and be informed by research on which modifications would have greatest impact.

P366

Identifying system, environment, and policy supports for physical activity in childcare settings

Authors:

Kelsie M. Full, Amy Binggelli-Vallarta, Griselda Cervantes, Hena Din, Jamie Moody, Guadalupe X. Ayala

Purpose:

For children ages 3-5 years who attend childcare, the majority of waking hours are spent in the childcare setting. Despite the connection shown between the childcare setting and children's physical activity (PA) levels, research exploring this connection is limited. This study examined system, environment, and policy factors of childcare settings related to children's PA in Imperial County, California, USA.

Methods:

Baseline provider interviews and observational data were collected from childcare centers (N=26) for the CDC-funded Childhood Obesity Research Demonstration (CORD) study known as Our Choice/Nuestra Opcion. Data collected assessed center policies, environments, and practices related to children's nutrition and PA. Descriptive analyses included examining time designated versus actual time spent on PA; center PA policies; and observations of appropriate PA equipment and space. These variables were cross-tabulated by center type (state versus private).

Results:

Stratified by center type, 14 of the participating childcare centers were state and 12 private. Differences between reported designated time versus actual time spent on active play were minimal, but only 42% of centers reported meeting the 60 minutes of recommended daily PA. Eight-five percent of state centers had a written policy for physical education compared to only 50% of private centers. Of all centers, 44% do not have a policy that prohibits providers from limiting active play among children who misbehave.

Conclusions:

Study results demonstrate that greater attention is needed to explore the differences between state and private childcare centers and what this means for the focus and design of future physical activity interventions.

P367

Do care-providers and the childcare environment influence UK preschoolers' in-care activity?

Authors:

Kathryn R. Hesketh, Esther M. van Sluijs

Purpose:

To determine if care-provider, environmental and policy factors in childcare settings are associated with average daily in-care physical activity (PA) of 3-4-year-old children.

Methods:

In 30 preschools in Cambridgeshire, UK, the in-care PA of 201 children (51% female) were measured using accelerometry for up to 7 days (4.2 ± 1.3). The childcare environment was assessed using the Environment and Policy Assessment and Observation tool. Demographic and carer information was taken from questionnaires. Three-level mixed-effects linear regression models assessed the association between interpersonal, environmental and policy factors and three outcomes: Average daily in-care minutes/hour spent sedentary (SED), in light PA (LPA) and moderate-to-vigorous PA (MVPA). Models were adjusted for sex, time in care and travel mode to care.

Results:

No evidence of clustering of PA within preschools was observed (intra-class correlation coefficients: 0.03-0.05). In univariable models, SED was positively associated with active opportunities, reported time spent in gross motor activity and children always going out in snow (compared to only with correct clothing), and negatively with number of preschool staff. Active opportunities remained significantly associated with SED in fully adjusted models (1.9 (95%CI: 0.9, 2.9) minutes/hour). Only number of preschool staff was associated with LPA (0.6 (0.1, 1.1) minutes/hour), no associations with MVPA were observed.

Conclusions:

Few care-provider, environmental and policy factors were associated with children's in-care activity. UK childcare policies advocating child-driven play and free-flow between indoors and outdoors may be more conducive to individual variation in PA. This should be considered when developing childcare-based interventions.

P368

Physical education and classroom behavior among preschoolers

Authors:

Spyridoula Vazou, Gayle Luze, Jackeline Krogh

Purpose:

The well-rounded development of the child, including physical, cognitive, emotional, and social dimensions, is considered the most efficient route to school readiness and academic success. The purpose of this pilot study was to examine the effect of Physical Education (PE) on classroom engagement in preschool children.

Methods:

Two intervention (N=27) and two control (N=13) preschool (3-5 years) classes were observed at the beginning (T1) and at the end (T2) of a 12-week intervention. The intervention included two 30-min structured Physical Education lessons per week. Engagement during classroom time was assessed through direct observations for 25 min. The intervention group was observed immediately after PE and on a separate day without PE.

Results:

Classroom cognitive engagement (verbally participates, asks/answers questions) at T1 was low but similar (27-56sec) between groups (intervention vs. control) and across conditions (with vs. without PE), whereas, at T2, preschoolers in the intervention group were more verbal after PE (169.67sec) than without PE (102.41sec) and compared to the control group (42.02sec). Additionally, in the intervention group, social engagement (being on-task by interacting with others)

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was higher after PE (66.06% of time) than without PE (40.87%) and compared to the control group (21.38%) at T1. Social engagement after PE was highest at T2 despite some improvement on the days without PE in both groups.

Conclusions:

Contrary to the assumption that physical activity may disrupt classroom behavior, these results suggest that a PE intervention may, in fact, improve cognitive and social aspects of classroom behavior among preschoolers.

P369

How day care home owners view their role in preventing childhood obesity

Authors:

Sara Sweitzer, Shreela Sharma, Courtney Byrd-Williams, Maria Jose Romo Palafox, Emmalee Bergez, Margaret Briley

Purpose:

Over 1.7 million children under age five in the United States are cared for in day care homes. Owners must have skills and knowledge to foster healthy dietary and physical activity behaviors in these young children. This qualitative study explored owners' knowledge, attitudes, and behaviors regarding nutrition and physical activity in their day home for children.

Methods:

A facilitator conducted 2-hour, audio-recorded group interviews using a modified nominal group technique with a convenience sample of 30 day care home owners. Two investigators reviewed written responses and transcripts for common themes then calculated frequencies of references.

Results:

Thirty owners, caring for an average of 11 young children, participated in four focus groups, two English-speaking and two Spanish-speaking. Owners viewed developing healthy habits as important, 96%, and valued by parents, but indicated a need to build communication. Responses indicated need for guidance for greater variety of foods, 22%, teaching children healthy food choices, 26%, and promoting outdoor physical activity, 20%. Nutrition related barriers included money, 30.9%, and child food behaviors, 26.2%. Frequent barriers to outdoor physical activity were weather, 38%, and insects, 20%. Nutrition related barriers included money, 30.9%, and child food behaviors, 26.2%.

Conclusions:

The day care home owners were interested in modeling and teaching healthy lifestyle to children and parents and would benefit from further training in their homes to prevent obesity.

P370

Effect of 'Lunch is in the Bag' program on communication between parents, children and the children's early care and education centers (ECEC) around fruits, vegetables and whole grains

Authors:

Shreela Sharma, Tasnuva Rashid, Ru-Jye Chuang, Sara Sweitzer, Courtney Byrd-Williams, Nalini Ranjit, Cindy Roberts-Gray, Deanna Hoelscher

Purpose:

To evaluate the effects of a behaviorally-based parent education program on communication between parent-child, and parent-early care education centers (ECEC) about fruits, vegetables and whole grains (FVWG).

Methods:

A group-randomized controlled trial (n=30 ECEC, 577 parent/child dyads) evaluating the effects of Lunch is in the Bag, a 5-week ECEC-based program to educate parents on how to pack healthy lunches for their preschoolers ages 3 to 5 years. Parent self-report surveys on parent-child and parent-ECEC communication about FVWG were conducted at baseline and post-intervention. Six summative scales, one each for FVWG, were developed for the parent-child and parent-ECEC communication (Range per scale - 0-16; Cronbach's alpha = 0.74 to 0.87). Multilevel linear regression analysis adjusting for center-level variance and covariates was used to determine program effects on the communication scales.

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Results:

Overall, communication scores were low at baseline, especially for parent-ECEC scales. For the parent-ECEC, there was a significant increase post-intervention in the mean scores for communication around vegetables (Adjusted $B = 0.78$, 95%CI: 0.13, 1.43, $p=0.002$), and communication around fruit (Adjusted $B = 0.62$, 95%CI: 0.04, 0.20, $p=0.04$). Univariate analysis showed significant increase in scores for whole grains (Unadjusted $B = 0.73$, 95%CI: 0.14, 1.33, $p=0.016$); however multivariate analysis rendered these not significant. While there was a trend towards improved scores for parent-child communication, these results were not statistically significant.

Conclusions:

Lunch is in the Bag strategies were successful in improving communication between parent-ECEC about FVWG which is critical to establish healthy eating habits in early childhood.

P371

Child feeding processes in families with overweight preschool children: A qualitative analysis of interviews with parents recruited from primary health care clinics in Mexico City

Authors:

Gloria Oliva Martínez-Andrade, Amalia Benitez-Trejo, Marco A. González-Unzaga, Elizabeth M. Cespedes, Jess Haines, Bernardo Turnbull Plaza, Ricardo Perez-Cuevas, Matthew W. Gillman

Purpose:

In Mexico, overweight prevalence among preschool children is ~10%. This study characterizes the child feeding process among families with overweight preschoolers attending primary health care clinics in Mexico City. The process surrounding child feeding in overweight preschool children has not been described previously in Mexico.

Methods:

From 2010-2011, we recruited participants from waiting rooms in 8 family medicine clinics, 4 run by the Ministry of Health and 4 by the Mexican Institute of Social Security. We conducted in-depth interviews with 52 families of overweight children 2-5 years of age (BMI z-score 2.0-3.0). We used grounded theory as a method to describe and explain the child feeding process. We focused on food selection, purchase, preparation and consumption, and the social actors and factors influencing the feeding process.

Results:

We conducted 52 interviews, 80% of which were with the child's mother, the rest with grandparents, aunts or fathers. Complacency, i.e. conceding to prepare the foods that parents, grandparents and children preferred, was present throughout the feeding process. Other factors were economic resources, food culture, family members with prescribed diets, available time and knowledge about food content. Children preferred to consume noodle soups, breaded foods, dairy and sugary drinks, while not accepting the vegetables.

Conclusions:

In the child feeding process, influential components involving high risk of overweight were identified, including acquiescing to the tastes of the family and preferences of the child, and cultural aspects, e.g. family traditions. Understanding and addressing these contextual factors could strengthen interventions to prevent childhood obesity.

P372

The effectiveness of CATCH Early Childhood, a preschool-based intervention, to increase Moderate-to-Vigorous Physical Activity among preschoolers from low-income Hispanic and African-American populations

Authors:

Ru-Jye Chuang, Shreela Sharma

Purpose:

Evidence suggests that preschoolers do not spend much time engaging in physical activity, especially moderate-to-vigorous Physical Activity (MVPA), and invest more time in sedentary activities. This study aims to examine the effective-

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ness of the Physical Education (PE) component of a preschool-based program, CATCH Early Childhood (CEC), on increasing preschoolers' percent time spent in MVPA while at preschool. CEC included over 500 structured physical activities and equipment aimed at promoting MVPA for preschoolers indoors and outdoors while at school.

Methods:

This was a group randomized controlled study (n=440 preschoolers, 3 intervention and 3 comparison centers) conducted in 2009-2010 school year in Head Start centers in Houston, TX. Preschoolers' physical activity level was measured by System for Observing Fitness Instruction Time-Preschool (SOFIT-P), which measured percent time preschoolers spend in MVPA during active times at preschool. Difference in percent time spent in MVPA was examined using Mann-Whitney U test and Analysis of Covariance (ANCOVA) adjusting for gender, intervention groups and baseline result.

Results:

54.5% of the preschoolers were Hispanic, and 37.9% of the preschoolers were overweight or obese at baseline. Percent time spent in sedentary behavior decreased both in intervention (p=0.005) and comparison (p=0.029) groups at post-test. Percent time spent in Indoor vigorous activity increased significantly at posttest among preschoolers in the intervention centers (baseline=0.69%, posttest=6.67%, p=0.049).

Conclusions:

Physical activity strategies used in CEC were effective among low-income preschoolers attending Head Start centers.

Effect of Built Environment on Physical Activity & Nutrition

P373

Individual dietary factors but not environmental characteristics of the neighborhood are associated with BMI decrease in adult obese women from Curitiba, Brazil

Authors:

Louise Farah Saliba, Adriano Akira Ferreira Hino, Rodrigo Siqueira Reis

Purpose:

This study hypothesized that individual dietary factors and environmental characteristics of the neighborhood are associated with BMI decrease in adult obese women.

Methods:

A quasi-experimental study was conducted with a group of 121 adult obese women from Curitiba, Brazil in 2011, during seven weeks having a dietary intervention (individual low-caloric diet and group counseling) for weight loss as major component. Multiple linear regression was used to test the hypothesis considering the following independent variables (calculated by scores): Eating out (eating in restaurants and fast foods); eating snacks (before the main meals), eating triggers (the tendency to eat when upset, angry, disappointed, overwhelmed, sad, bored or anxious), external stimuli (eating after seeing or smelling food), food outlets (number of supermarkets, farmer's market and restaurants in a 1km network buffer around each participant's home). The outcome variable was defined a difference between pre-post BMI. All analyzes were adjusted for age, SES and working/studying status.

Results:

The analytical sample was composed by 71 subjects. Eating out was correlated to smaller decrease in BMI (Beta=.510; p=.016), and the participants who had a tendency to eat with a food physiologic stimuli lost more weight (Beta= -.618; p= .007). BMI decrease and the number of food outlets were not associated.

Conclusions:

Individual factors but not access food outlets were associated with weight loss among obese women. The food options seem to be more important than the access to food outlets. This might guide future interventions aiming at reducing weight status.

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Using the built environment to increase adolescent physical activity: A randomized control trial

Authors:

Nicolas Oreskovic, Elizabeth Goodman, Alyssa Robinson, Jonathan Winickoff

Purpose:

A randomized control trial (RCT) to increase adolescent physical activity through active use of the built environment.

Methods:

Sixty overweight and obese adolescents ages 10-16 years will participate in a pilot RCT testing use of the built environment to increase moderate-to-vigorous physical activity (MVPA). Physical activity data (accelerometer) and location data (GPS) are collected for one week at baseline, short-term follow up (1 week post counseling), and long-term follow up (3 months post counseling). Control subjects receive standard of care counseling on lifestyle modifications (diet and physical activity). Intervention subjects receive standard of care counseling along with personalized built environment recommendations to increase MPVA based on subjects' baseline combined GPS-accelerometer data. Physical activity and built environment use goals are set by intervention subjects, subjects' families, and the study team, which includes a pediatrician. Intervention subjects also receive reminders about their built environment and physical activity recommendations along with financial incentives to meet their goals. The primary study outcome is daily minutes of MVPA, secondary outcome measures are changes in built environment use and sedentary time.

Results:

17/60 subjects are enrolled to date. A difference-in-difference analysis will compare the change in percentage of subjects within each group achieving the 60 minutes of recommended daily MVPA.

Conclusions:

To our knowledge, this is the first randomized control trial to specifically use and counsel on a subject's personal built environment to increase adolescent physical activity.

P375

Walking for transportation: What do U.S. adults think is a reasonable distance and time?

Authors:

Kathleen Watson, Susan Carlson, Dianna Carroll, Janet Fulton

Purpose:

To determine 1) the distance and time U.S. adults think is reasonable for transportation walking and 2) whether adults who think longer distances and times are reasonable spend more time transportation walking.

Methods:

Analysis is based on adults (n=3,724) who participated in the 2010 HealthStyles mail-panel survey, a cross-sectional, nationwide sample. Response options for reasonable distance were: None, <0.5 miles, 0.5 - <1 mile, 1 - <1.5 miles, 1.5 - <2 miles, and 2+ miles. Response options for reasonable time were: None, 1-5 minutes, 6-10 minutes, 11-20 minutes, 21-30 minutes, and 31+ minutes. Time spent walking was calculated as the product of the number of days and minutes per day adults walked for transportation.

Results:

Most adults think transportation walking is reasonable; however, less than half of adults think walking at least a mile or at least 20 minutes is reasonable. What adults think is reasonable is similar across most demographic subgroups, except age group where older adults think shorter distances and times are reasonable. Trend analysis indicated adults who think longer distances ($p < .001$) and times ($p < .001$) are reasonable spent more time transportation walking.

Conclusions:

Strategies aimed at promoting shorter trips have the potential to increase transportation walking because short walking distances are acceptable to most US adults. Public health programs designed to encourage longer distance trips may wish to improve supports for transportation walking to make walking longer distances seem easier and more acceptable to most U.S. adults.

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Youth sedentary screen time and parents' perceptions of neighborhood crime and neighborhood design

Authors:

Nora Geary, James Aaron Hipp, Elizabeth Dodson, Marissa Zwald, Leslie Duling

Purpose:

In the United States, 18% of adolescents were obese in 2010. Furthermore, physical inactivity and obesity disproportionately impact minority and low-income populations. This research examined factors that may be associated with sedentary behaviors among youth living in St. Louis, Missouri. Factors investigated included parent's perceptions of neighborhood crime and poor neighborhood design (e.g., presence of sidewalks, street lighting, and crosswalks).

Methods:

Surveys were mailed to a random selection of households in St. Louis, Missouri. Only participating households with children were selected for the current analysis (n=228). Binary logistic regressions and one sample t-tests assessed the association between the amount of time youth spent in sedentary screen time (SST) and parent's perceptions of neighborhood crime and neighborhood design.

Results:

70% of the sample was African American and 57% had household incomes under \$29,999 (US). Age of the child was the only significant predictor of SST. Children between 7-12 were eight times more likely to engage in more than two hours of SST daily ($p<.001$) and children between 13-18 years old were 18 times more likely to engage in more than two hours of SST ($p<.001$) compared children under 7 years old.

Conclusions:

Understanding the interplay between factors that are associated with youth SST is essential to developing effective and sustainable interventions to reduce physical inactivity. Since children's age was the only factor significantly associated with SST, strategies targeting children between 7-18 years old is highly recommended because they are at an elevated risk.

P377

Associations of neighborhood walkability with working adults' physically-active and sedentary time, by week and weekend days

Authors:

Jacqueline Kerr, Kelli Cain, Neville Owen, Brian Saelens, Lawrence Frank, Terry Conway, James Sallis

Purpose:

To assess whether the relationship of neighborhood walkability with physically active and sedentary time varied by weekday or weekend. Working adults may be less influenced by their home neighborhood environment during the work week when they spend more time away from home.

Methods:

Adults were recruited from neighborhoods in the US varying in income and walkability. They wore an Actigraph accelerometer for 7 days. GIS-based walkability was computed around homes. Average daily moderate vigorous physical activity (MVPA) (1952+ cpm) and sedentary behavior minutes (≤ 100 cpm) were calculated for weekdays and weekend days. Mixed effects linear regressions, adjusting for neighborhood clustering, were performed on data from those (N=1733) reporting working full or part time outside of their home.

Results:

There was a significant positive relationship between walkability and sedentary weekday minutes ($F 6.91$; $p=.01$). Neighborhood walkability was not related to weekend sedentary minutes. Walkability was related to MVPA during the week ($F 33.6$, $p<.001$) and weekend ($F 8.2$, $p=.006$).

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Conclusions:

Having convenient neighborhood walkability may support physical activity during weekdays when there are other competing time demands. The positive relationship between walkability and sedentary behavior may reflect that people living in walkable neighborhood have more sedentary occupations. GPS data would clarify where MVPA and sedentary behaviors occur.

P378

Association of built environment and physical activity among Eastern Asian adolescents: A systematic review protocol

Authors:

Ling-Ling Lee, Yi-Liang Kuo

Purpose:

To systematically review the available literature from peer reviewed papers on the associations between built environment and physical activity of adolescents in Eastern Asian countries. Regular physical activity has been shown to be associated with reductions in the incidence of chronic diseases and effective in attenuating or reversing the disease process. However, there were more than 80% of adolescents not meeting recommended level of physical activity. Several systematic reviews summarized the evidence on various levels of association between built environment and physical activity in adolescents. Nearly all the studies reviewed are conducted in countries of North American, European, and Oceania regions.

Methods:

A systematic review will be conducted. A total of about twelve electronic databases from the domains of medical, nursing, education, environment, evidence base, and physical activity will be searched. Searches from websites, bibliographies and expert contacts will also be conducted.

Results:

A systematic review approach of Cochrane collaboration and Meta-analysis of Observational Studies (MOOSE) guidelines will be adopted for conducting the present review. Observational studies, such as cross-sectional, case-control, or cohort studies reporting associations between built environment and amount of physical activity will be included.

Conclusions:

The present review will hopefully add evidence on the association of built environment and physical activity among Eastern Asian adolescents who represent different social economic and cultural attributes.

P379

Food environments in New Zealand: Policies and impacts on health and equity

Authors:

Stefanie Vandevijvere, Boyd Swinburn

Purpose:

No country to date has implemented a comprehensive approach to survey its food environments, and 'no monitoring' translates into 'no action'. National monitoring of the healthiness of food environments and policies will be started in New Zealand from 2014 onwards.

Methods:

Composition of foods, and health-related labels and promotional characters on food packages will be assessed. A representative sample of supermarkets and schools will be selected to measure prices and affordability of foods and diets, shelf space and placement of foods (supermarkets), nutritional quality of foods provided and sold (schools) and outdoor food advertising (schools). Locations of all fast food chains, supermarkets, convenience stores, farmers markets, and other food outlets will be geocoded to assess the relative density of healthy/unhealthy food outlets around schools and residential homes, and to identify potential food swamps/deserts. Food promotion via television, magazines, sport sponsorships, internet and social media will be measured. For food provision, retail, prices, and promotion 'environ-

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mental equity' indicators will be included to assess the links between policies and equity outcomes and check progress towards reducing diet-related health inequalities. Government policy implementation is evaluated via the Government Healthy Food Environment Policy Index (Food-EPI), and publically disclosed and hidden food industry practices are investigated through the Access to Nutrition Index and complementary analyses. The (in)direct impacts of trade agreements on the New Zealand food environment are evaluated.

Conclusions:

This first survey will allow cost-effective repeated nation-wide monitoring of food environments and comparison of New Zealand with other countries as a first step towards global benchmarking.

P380

Individual, social and environmental correlates of healthy and unhealthy eating patterns

Authors:

Gina Trapp, Siobhan Hickling, Hayley Christian, Fiona Bull, Anna Timperio, Bryan Boruff, Damber Shrestha, Billie Giles-Corti

Purpose:

While understanding the correlates of healthy (and unhealthy) dietary intake is a priority, few studies have used an ecological approach. This study examined the association between individual, social and environmental factors on composite measures of healthy and unhealthy dietary intake in adults.

Methods:

Participants (n=565) of the Australian RESIDential Environments project self-reported dietary intake, home food availability and behavioural and perceived social and physical environmental influences on food choices. A geographic information system (GIS) measured proximity of supermarkets from each participant's home. 'Healthy' and 'unhealthy' eating scores were computed based on adherence to dietary guidelines. Multivariate models were constructed using linear regression.

Results:

After adjustment, 'healthy' eating (mean=6.25, SD=1.95) was significantly associated with having confidence to prepare healthy meals ($\beta=0.33$; 95%CI=0.12, 0.54); having more healthy ($\beta=0.12$; 95%CI=0.09, 0.16) and fewer unhealthy ($\beta=-0.04$; 95%CI=-0.06, -0.02) foods available at home; and having a supermarket within 800m of home ($\beta=1.32$; 95%CI=0.29, 2.34). 'Unhealthy' eating (mean=3.53, SD=2.06) was associated with being male ($\beta=0.39$; 95%CI=0.02, 0.75), frequently eating take-away ($\beta=0.34$; 95%CI=0.22, 0.47) and cafe or restaurant meals ($\beta=0.20$; 95%CI=0.07, 0.34) and having fewer healthy ($\beta=-0.07$; 95%CI=-0.11, -0.10) and more unhealthy ($\beta=0.08$; 95%CI=0.07, 0.10) foods available within the home.

Conclusions:

Initiatives to improve adherence to dietary guidelines and reduce the consumption of unhealthy foods needs to be multifaceted; addressing individual factors and access to healthy food choices in both the home and neighbourhood food environment. Ensuring proximity to local supermarkets, particularly in new suburban developments, appears to be an important strategy for facilitating healthy eating.

P381

Residential preference for walkable neighbourhoods in Toronto and Vancouver

Authors:

Lawrence Frank, Suzanne Kershaw, James Chapman, Monica Campbell, Helena Swinkels

Purpose:

The study examined residential preference towards walkable and transit-supportive neighbourhoods in two of Canada's largest metropolitan regions. Unmet demand for more walkable environments was quantified, as well as associations between the built environment, travel behavior and health.

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Methods:

A web-based stated preference survey was conducted with 1,525 people in the Greater Toronto Area and 1,223 people in Metro Vancouver. Participants indicated their neighbourhood preference in a series of illustrated trade-off scenarios contrasting walkable vs. auto-oriented neighbourhood design features. The survey also captured information about walking behavior, public transit and vehicle use, and height/weight.

Results:

Between 45-64% of residents in the Cities of Toronto and Vancouver strongly prefer living in walkable settings that enable active transportation choices compared to just 6-15% who strongly prefer auto-oriented places. Unmet demand for walkable environments was demonstrated among people who perceive their existing neighbourhood as very unwalkable. Living in walking distance to a variety of food stores and shops and services were the neighbourhood features most desired among those who live in low walk places, with a willingness shown to sacrifice elements of more auto-characteristic neighbourhoods to achieve this. Both neighbourhood walkability and neighbourhood preference were significantly associated with the travel choices selected by residents in Toronto and Vancouver.

Conclusions:

Study results support designing neighbourhoods that better align with observed residential preferences, and complement other studies in the field that suggest an association between the built environment and travel behavior.

P382

Predicting physical activity and health impacts of neighborhood built environment modification

Authors:

Lawrence Frank, Jared Ulmer, Sarah Kavage

Purpose:

The objective of this research was to develop a scenario planning tool to predict physical activity and health impacts of proposed modifications to the built environment.

Methods:

Neighborhood built environment characteristics were quantified for San Diego County participants of the California Health Interview Survey data and the SANDAG Household Travel Survey. Associations between neighborhood characteristics and physical activity, travel behavior, obesity, and related health outcomes were estimated after adjusting for demographic and socioeconomic covariates.

Results:

Built environment characteristics most consistently found to be associated with more physical activity, lower body weight, and better physical health for all cohorts (adults, adolescents, and children) included park access, street connectivity, sidewalk coverage, and less neighborhood traffic volume. Characteristics indicative of urbanity such as mixed land use, floor: Area ratio, and residential density were generally associated with better health outcomes for adults but worse for adolescents. Closer proximity to schools was strongly related to increased likelihood of walking or biking to school for adolescents and children. Closer proximity to grocery stores was associated with lower body weight for adults and children and more utilitarian walking for adults. Closer proximity to fast food restaurants was associated with higher likelihood of having type 2 diabetes for adults and higher likelihood of eating fast food for children.

Conclusions:

Neighborhood built environment characteristics were found to be significantly associated with physical activity and health outcomes. The predictive modeling tool can help public agency staff to better understand the health implications of planning and development decisions.

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Putting the person back into neighborhood food environments

Authors:

Margaret Demment, Meredith Graham, Christine Olson

Purpose:

In the US, there is a strong association between demographics and neighborhood environment. Yet, few studies have examined how demographics in relation to food environment contribute to diet. The objective of this study is to examine if the perceived food environment mediates the association between a woman's demographic profile and her fruit and vegetable (F&V) consumption.

Methods:

This study employs two sources of data from a sample of racially and socioeconomically diverse pregnant women (n=1689): 1) Recruitment data and 2) surveys, completed by 78% of the sample (n=1325). The independent variable, demographic profile, derived through latent-class analysis, used these recruitment variables: BMI category, race, ethnicity, age, and low-income. The mediating variable was derived from a woman's survey responses to the perceived quality and selection of fresh fruit and vegetables in her neighborhood using a Likert scale. The outcome was derived from self-reported F&V consumption. Preliminary results analyzed change in Wald Chi-square statistics while future analysis will include mediation models using PROCESS in SAS to explore our objective.

Results:

In a preliminary logistic model, both perceived quality of F&V and demographic profile were significantly associated with F&V consumption. When perceived quality is added to the model the Wald Chi-square statistic for profile decreases from 60.6 to 30.4, suggesting that quality partially mediates the relationship between profile and F&V consumption.

Conclusions:

Teasing apart individual and neighborhood contributions to diet are challenging. The findings from this study will help us better understand the role of each in a diverse sample of women.

P384

Drowning in sugar: Assessing community awareness and response to a sugar-sweetened beverage print-media campaign in Santa Clara County, California

Authors:

Morgan Jones, Mariah Lafleur, Sallie Yoshida

Purpose:

As part of a Communities Putting Prevention to Work grant from the Centers for Disease Control and Prevention, Santa Clara County (SCC), California, developed and disseminated a print-media campaign called "Drowning in Sugar" to encourage parents to reduce their children's consumption of sugar sweetened beverages (SSB). Samuels Center partnered with the SCC Public Health Department to design and conduct an intercept survey with county residents to assess awareness and impact of the campaign.

Methods:

In March 2013, the survey was conducted in public venues with 1,341 Spanish- and English-speaking county residents with children under the age of 11. Survey data was entered in SPSS and analyzed using statistical methods such as chi squared tests.

Results:

Overall, 41% of surveyed residents reported recalling the campaign. Among those who saw the campaign, 90% were female, 72% were Latino, 55% earned less than \$40,000, and 52% took the survey in Spanish. Forty-eight percent of those who saw it reported decreasing the number of SSBs they served their children, and 46% said it increased the amount of water they served their children.

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Conclusions:

About half of the residents who reported seeing Drowning in Sugar reported decreasing SSBs and increasing water offered to their children. The campaign was successful in reaching the target population of low-income Latino residents who have a high consumption of SSBs. These findings show that well-targeted SSB campaigns have the potential to decrease consumption of SSBs and contribute to the growing body of knowledge about the effectiveness of campaigns to reduce SSB consumption.

P385

Assessing the healthy corner store environment: Development of a measurement toolkit for use across rural and urban settings

Authors:

Courtney Pinard, Leah Carpenter, Teresa Smith, Amy Yaroch

Purpose:

To address the measurement gap in the food environment by developing a toolkit using mainly qualitative methodology to assess a breadth of factors in the corner store food environment through the lens of food access and childhood obesity prevention.

Methods:

An integrative review of literature was conducted which reviewed manuscripts describing: (1) Key outcomes related to healthy food retail, specific to corner stores, and (2) measurement tools developed to assess key outcome in healthy corner store work. The Cooper Method-Description Approach was used to integrate and evaluate the diverse set of research and evidence. In addition, key informant interviews will be conducted with urban and rural store-owners along with concurrent NEMS-S assessments (n=30; to explore key issues from their perspective) and content experts (n=20; to describe in detail measurement gaps).

Results:

Seventy-five manuscripts were reviewed and categorized based on their study design (qualitative, cross-sectional, experimental, longitudinal measurement, etc.). Many cross-sectional studies (n=42) described the relationship between neighborhood food availability and dietary outcomes. In terms of measurement, several audit tools (n=7) exist to assess the food environment and few or no tools exist to assess consumer decision-making and the store-owner perspective. Interviews and NEMS-S assessments will be conducted in the next months and themes and categories coded and described.

Conclusions:

The integrative literature review and key informant interviews will inform the recommendation of measurement tools to assess healthy corner store efforts as well as identify gaps in measurement and key factors to assess in future measurement development studies.

P386

Relative availability of healthier food options differs across communities in the United States

Authors:

Shannon Zenk, Lisa Powell, Leah Rimkus, Zeynep Isgor, Dianne Barker, Punam Ohri-Vachaspati

Purpose:

As one of the first nationwide studies of directly observed food availability in the U.S., this study compared the relative availability of healthier to less healthy food and beverage options across communities.

Methods:

This cross-sectional study draws on three years of pooled data (2010-2012) from 8,392 stores located in 469 communities spanning 46 states from the Bridging the Gap Community Obesity Measures Project. Each year trained observers visited a representative sample of supermarkets, grocery stores, and 'limited service' stores (including convenience, small discount, pharmacy, and other stores) in each community. Relative availability of healthier food and beverage op-

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tions was measured as a ratio of counts of 7 healthier products (e.g., whole wheat bread, low-fat cheese) to 7 matched standard products (e.g., white bread, regular cheese). Community characteristics were measured based on American Community Survey data and included racial/ethnic composition (>50% non-Hispanic white, >50% non-Hispanic black, >50% Hispanic, other), economic characteristics (median household income in quintiles), and urbanicity (urban, suburban, rural). Ordinary least squares regression estimated relationships, adjusting for year, region, and store type.

Results:

A graded relationship between median household income and relative availability of healthier options was evident, with relative availability declining with decreasing income. While differences were larger based on income, black and Hispanic communities had lower relative availability compared to white communities, adjusting for income. No differences by urbanicity were found.

Conclusions:

Policies to address the imbalance of healthier to less healthy food products may be needed to improve population health and reduce disparities.

P387

Greenspace and MVPA in urban and rural Scottish adolescents: A study using accelerometry, GPS, and GIS

Authors:

Paul McCrorie, Scott MacDonald, Natalie Nicholls, Anne Ellaway

Purpose:

The importance of greenspace for young people's moderate-vigorous physical activity (MVPA) is still unknown. Few studies exist which combine accelerometry, Global Positioning System (GPS), and Geographic Information Systems (GIS) among youths. This study investigated the relationship between (i) amount of neighbourhood greenspace and MVPA, and (ii) MVPA time expended in greenspace, comparing across urban and rural settings.

Methods:

Seventy participants (rural=39) wore the Actigraph GT3X+ and Garmin Foretrex 301 for seven days in May 2013. Time-stamped data were matched and transferred to a GIS package to identify points falling within greenspace. 800m road/path network buffers around residences were used to represent neighbourhoods. Percentage (%) of the buffer categorised as greenspace was used as the predictor. Outcomes were % of total recorded time that was MVPA, and total MVPA time spent in greenspace.

Results:

Neighbourhood greenspace was a significant predictor of % time in MVPA ($b = 0.22$, $p=0.018$), but was unrelated to urban/rural setting. For a day consisting of 500 mins, an increase of 1m² in neighbourhood greenspace would result in an increase of 1.1 MVPA mins. However, no effect was found for MVPA time expended in greenspace, regardless of urban/rural setting.

Conclusions:

Initial results suggest that neighbourhood greenspace has a positive impact on Scottish adolescents MVPA, regardless of urban/rural setting; however, more greenspace in the local residential neighbourhood may not result in greater MVPA time expended in greenspace. Further analyses will investigate total greenspace use (by intensity classification), across urban and rural settings, gender and area deprivation.

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Environmental correlates of adolescents and young adults walking behaviors. Results from a Czech national study

Authors:

Ferdinand Salonna, Karel Fromel, Dana Feltlova, Igor Fojtik, Emil Repka, Oldrich Racek, Ladislav Blaha, Ales Suchomel

Purpose:

This study investigated the relation of Czech adolescents and young adults walking behavior to the perception of neighbourhood design.

Methods:

The sample consisted of 3170 Czech adolescents and young adults (47.8% males; aged from 15 to 26). To measure the neighbourhood design and recreational environmental variables, modified version of Neighbourhood Environment Walkability Scale - Abbreviated (NEWS-A) was used. The walking behaviour was objectively measured by pedometers. 10000 steps per-day was set as a cut-point for determining the sufficient walking activity. To assess the relation of adolescents walking behaviour to neighbourhood and environmental variables logistical regression models were computed. Analyses were performed separately for both genders, working week days and weekends and controlled for the age of respondents.

Results:

It was found that some environmental variables were related to walking behaviors adolescents and young adults. Sufficient walking during working days among females was associated with Land use mix-diversity (i.e. "Stores, facilities, and other"), Walking/cycling facilities, Aesthetics (i.e. "neighbourhood surroundings"), Pedestrian/traffic safety/Crime safety. Sufficient walking during working days among males was associated only with Land use mix-access ("Access to services"). Much weaker associations were found during weekends. While sufficient walking among females was associated only with Aesthetics no association between walking behavior and environmental variables was found among males.

Conclusions:

Association of environmental correlates with young Czechs walking seems to be gender specific. Females' walking behavior turned out to be more sensitive to the neighbourhood design. Association between perceived neighbourhood design and sufficient walking during weekends among Czech youth is negligible.

P389

Neighborhood characteristics and active school transport: Parental active transport routines (PATRns) as moderator

Authors:

Dave Van Kann, Stef Kremers, Sanne de Vries, Nanne de Vries, Maria Jansen

Purpose:

To develop and successfully implement interventions targeting active school transport a better understanding of this behavior is needed. This study focuses on the associations between the physical and social environment and active school transport. Further, the associations between parental active transport routines (PATRns) and children's active school transport are explored as well as the role of PATRns as possible moderator of the association between the physical and social environment and active school transport.

Methods:

The study focused on 735 8-to-12-year old children and their parents living in the Netherlands. Active school transport and PATRns (based on habit theory) were assessed using questionnaires. Physical and social neighborhood characteristics were observed using a checklist. Distance to school was calculated using home addresses. Multivariate linear regression analyses were performed, with frequency of using active school transport (i.e. walking or biking) as dependent variable.

Results:

Distance to school had a strong negative association with active school transport. PATRns were the strongest positive correlate of active school transport. Moreover, PATRns were a moderator of the association between distance and

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children's active school transport ($p < .06$). Stratified analyses showed that distance was a stronger predictor of inactive school transport in the weak PATRns-group ($\beta = .45$) compared with the strong PATRns-group ($\beta = .26$).

Conclusions:

Parental active transport routines (PATRns) have a direct influence on active school transport as well as a moderating influence on the association between distance and active school transport which emphasizes the potential relevance of this concept in efforts to increase active school transport.

P390

Relationships between the built environment and neighborhood-based physical activity among subpopulations

Authors:

Gavin McCormack, Alan Shiell, Patricia Doyle-Baker, Christine Friedenreich, Beverly Sandalack

Purpose:

A growing body of evidence suggests that higher levels of neighborhood walkability can encourage higher levels of physical activity. Knowing whether the influence of the neighborhood built environment on physical activity is heterogeneous across subpopulations is important for better understanding the causes of health inequalities. We examined whether associations between neighborhood walkability and physical activity are similar for adults with different sociodemographic and health-related characteristics.

Methods:

A random cross-sectional sample of $n = 2006$ adults (Calgary, Alberta) completed both a telephone-interview and a self-administered questionnaire. Physical activity-related information, sociodemographic, and health-related characteristics were captured. Usual weekly minutes of neighborhood-based walking, moderate-intensity, and vigorous-intensity physical activity were weighted by their metabolic equivalents and totaled. Objective built environment attributes underwent a two-staged cluster analysis which identified three neighbourhood types (HW: high walkable; MW: medium walkable; LW: low walkable). Generalized Linear Models were used to estimate the differences in total neighborhood-based physical activity (MET.minutes/week) between the neighborhood types within sociodemographic and health-status strata.

Results:

With the exception of those ≥ 61 years of age, overweight, and dog owners, other residents of high walkable neighborhoods participated in higher amounts of physical activity compared with those residing in medium or low walkable neighborhoods after adjusting for covariates ($p < .05$).

Conclusions:

Creating neighbourhoods with a highly connected pedestrian network, a large mix of businesses, high population density, high access to sidewalks/pathways, and many bus stops within walking distance does not appear to lead to subpopulation heterogeneity in physical activity levels and therefore is a potentially effective population health intervention.

P391

Associations between local zoning for recreation spaces and public park availability

Authors:

Christopher Quinn, Jamie Chriqui, Sandy Slater, Emily Thrun, Dianne Barker, Frank Chaloupka

Purpose:

Local zoning and land use laws are potentially important mechanisms through which communities can provide residents with opportunities for recreational exercise. This study examined whether recreation policies were associated with the number and density of public parks in communities around the United States.

Methods:

Zoning and related ordinances were collected from 724 local governments surrounding 308 secondary school catchment areas in 2010 and 2011. Trained policy analysts identified presence and strength of active (e.g., parks containing play-

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grounds, athletic fields), and passive (e.g. open/green space not mentioning activity-related infrastructure) recreation-related provisions while field observers conducted direct observations of local parks in the communities. Generalized linear models were used to estimate associations between policies and environments, controlling for community and demographic covariates.

Results:

Any zoning for recreation areas was nearly universal. Three-fourths of the catchments had required provisions for active recreation while 88% had required passive recreation provisions. Rural and lower income areas were least likely to have required policies. In preliminary multivariate models, the expected number of parks increased by 35% ($p=.005$) when the policy required active recreation (compared to no policy). Increasing the proportion of population exposed to required active recreation policies by 50% was associated with a 13.8% increase in the mean number of parks. Passive recreation provisions were not associated with number of local parks. Park density increased significantly with greater population exposure to any active or passive recreation policies.

Conclusions:

Zoning and land use policies may be important for increasing opportunities for physical activity in communities.

P392

An evaluation of the effectiveness of the federal Safe Routes to School program using before-and-after data from four states

Authors:

Noreen McDonald, Ruth Steiner, Chanam Lee, Yizhao Yang, Xuemei Zhu, Tori Rhoulac Smith

Purpose:

In 2005, the U.S. Congress identified increasing walking and bicycling to school a national objective in the Safe Efficient, Flexible, Efficient Transportation Equity Act: A Legacy to Its Users (SAFETEA-LU). Since the passage of this legislation, the USDOT has allocated over \$1.15 billion to fund Safe Routes to School (SRTS) interventions throughout the country. Although the program has received much media attention, no large-scale before-and-after study has been completed to understand the effectiveness of SRTS interventions.

Methods:

This study utilized a quasi-experimental research design to assess the impacts of the SRTS program on travel mode to and from school for elementary and middle school students. Researchers developed a comprehensive database of SRTS interventions in the District of Columbia, Florida, Oregon, and Texas and measured trends in school travel using administratively collected records from 694 schools between 2007 and 2012. Program impacts were assessed through panel data models.

Results:

Models show that some SRTS interventions have increased walking and biking to school. Characteristics of the school and local environment also have significant influence on active travel to school.

Conclusions:

Research results suggest the government policies can increase walking and biking and therefore may be a policy tool for increasing physical activity. However, there is substantial variation in the impact of the Safe Routes to School program across schools. This highlights the importance of the local context and quality of implementation.

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P393

Associations between neighbourhood typologies and MVPA and sedentary time

Authors:

Anna Timperio, David Crawford, Kylie Ball, Jo Salmon

Purpose:

Most studies of neighbourhood features examine singular neighbourhood attributes, which may pattern in different ways. This study aimed to identify typologies of neighbourhood attributes and their associations with physical activity among children.

Methods:

The homes of 808 children aged 5-6 and 10-12 years were mapped in a Geographic Information System. The following attributes were computed within 800m of each home: Land use mix; playgrounds; sports venues; 4-way intersections; cul-de-sacs; 'busy' roads. Crime statistics were obtained at the post-code level. ActiGraph accelerometers were worn for seven days. Wards and K-median cluster analyses were used to identify distinct, interpretable clusters of neighbourhood attributes. Cluster membership was regressed on moderate-to-vigorous physical activity (MVPA) and sedentary time in the after-school period (n=637) and on weekends (n=540), controlling for sex, age group, maternal education, accelerometer wear time and clustering by school.

Results:

A four cluster solution was extracted: 1) High street connectivity, many play/sport destinations, high crime; 2) high mixed land use, few play/sport destinations, high traffic; 3) high mixed land use, few play/sport destinations, low traffic; 4) low street connectivity, many play/sport destinations, low crime. Membership of Cluster 1 was positively (B=9.1, p=0.05) and Cluster 2 was negatively (B=-9.7, p=0.022) associated with MVPA on weekends. Associations between Cluster 2 and sedentary time on weekends (B=15.9, p=0.056) and between Cluster 1 and MVPA on weekdays (B=2.0, p=0.078) approached significance.

Conclusions:

The results highlight the importance of examining how neighbourhood attributes cluster and suggest that different combinations of attributes can have differential effects on physical activity.

P394

Socioeconomic and race/ethnic inequalities in observed park quality

Authors:

Jessa Engelberg, Terry Conway, Carrie Geremia, Kelli Cain, Brian Saelans, Lawrence Frank, Karen Glanz, James Sallis

Purpose:

Disparities in park availability are well studied, but disparities in park amenities and facilities have been infrequently examined. The current study examined potential disparities by area income and race/ethnicity.

Methods:

Cross-sectional study of 472 parks was conducted in Seattle and San Diego. Parks in more walkable areas were audited using the Environmental Assessment of Public Recreation Spaces (EAPRS) to assess presence, condition, and cleanliness of amenities (i.e. fields, courts, play sets) and facilities (i.e. restrooms, tables, seating). General linear model regressions investigated Census 2000-derived race/ethnicity and income relationships with 7 park environment variables: Physical activity (PA) amenity count, PA amenity quality, field/courts score, trail score, play set score, aesthetics score, and total park score. Interactions between race/ethnicity and income were assessed, and then main effects if the interaction was insignificant.

Results:

Results indicated three interactions/trends between race/ethnicity and income with park outcomes: 1) PA quality (p<.001; positive association with income for high percent minority, negative with high percent white); 2) total park

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score ($p=0.079$; negative association with income for high white, no association for high minority); and 3) aesthetics score ($p=0.069$; positive association with income for high minority, but no association with high white). One main effect indicated high minority neighborhoods had fewer park amenities for PA ($p=0.003$).

Conclusions:

Parks may be ideal locations for PA, particularly for low-SES groups as they are free. Though complex, present findings document race/ethnicity and income differences in park qualities thought to be associated with PA.

P395

Perceived environment and neighbourhood characteristics: What is their relationship with physical activity of heart disease patients not attending cardiac rehabilitation?

Authors:

Suzanne Ferrier, Nicholas Giacomantonio, Daniel Rainham, John Spence, Ryan Rhodes, Robert Reid, Darren Warburton, Chris Blanchard

Purpose:

Emerging literature suggests that the environment can impact physical activity levels. To date, however, very little is known about the role of the environment with individuals living with heart disease. The purpose of this study was to objectively measure the physical activity (PA) of individuals with coronary heart disease (CHD) who were not enrolled in a cardiac rehabilitation program, and to examine its relationship with perceived neighbourhood characteristics.

Methods:

324 CHD patients from 8 sites across Canada wore an accelerometer and GPS unit for 7 days and completed a questionnaire that included demographic and neighbourhood characteristics. Accelerometers had to be worn for a minimum of 10 hours/day for at least 4 days to be used in the analyses. ActiLife 6 software was used to calculate the number of minutes per day participants engaged in light, moderate and vigorous PA.

Results:

Data for 290 participants (mean age = 65.37; 71% male; 90.5% white) were analyzed. On average, participants engaged in 123.2 (SD=43.5) minutes/day of light activity, 33.6 (SD=23.6) minutes/day of moderate activity, and 2.4 (SD=9.2) minutes/day of vigorous activity. Zero-order correlations showed that moderate PA was significantly associated with perceived positive neighbourhood cohesion ($r=.153$, $p<.05$), positive neighborhood characteristics ($r=-.179$; $p<.005$), and more places to do PA in the community ($r=.281$; $p<.001$). Light and vigorous PA were not associated with neighbourhood characteristics.

Conclusions:

Based on the preliminary findings, perceived neighbourhood characteristics should be considered when designing physical activity interventions for CHD patients who are not enrolled in cardiac rehab.

P396

Ethnic differences in associations between an ego-centric measure of neighbourhood walkability, walking and BMI in adults: The ORiEL study

Authors:

Steven Cummins, Daniel Lewis, Ellen Flint, Neil Smith, ORiEL Investigators

Purpose:

Walking has been described as the best buy for public health. Living in more walkable neighbourhoods has been found to increase walking, but little is known about whether effects are moderated by ethnicity. Here we assess the extent to which objectively measured walkability predicts walking, and BMI in an ethnically diverse sample of adults in the ORiEL Study.

Methods:

This study uses baseline adult data (2012) from The ORiEL Study ($n=1280$). Neighbourhood walkability is assessed using the method developed by Frank et al (2005). We constructed an index based upon three components: Street intersec-

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tion density, residential density, and land use mix. We demonstrate the construction of these components using geospatial reference data for East London, UK (Ordnance Survey MasterMap). Bespoke individual measures of neighbourhood walkability are created using an ego-centric approach with 1000m network buffer. Ethnic differences in associations with walkability and walking and BMI in adults, adjusting for co-variables, are assessed.

Results:

Neighbourhood walkability and ethnic density is strongly spatially patterned with greater walkability and greater ethnic density within the more highly urbanised neighbourhoods of the study site. Final results from multivariate regression analyses, stratified by ethnicity, will be presented to show relationships between neighbourhood walkability, walking and BMI.

Conclusions:

Walkability has been shown previously to correlate with both the BMI and physical activity of local populations. However, few walkability studies have investigated, using an ego-centric approach, whether ethnicity moderates relations between the built environment and walking.

P397

Ecological correlates of sedentary time in adolescents: Individual, interpersonal, home & neighborhood

Authors:

Jacqueline Kerr, Andrew Atkin, Jordan Carlson, Dori Rosenberg, Brian Saelens, Terry Conway, Neville Owen, James Sallis

Purpose:

Ecological models of physical activity (PA) have shown influences on behavior at each level of the model. Ecological models for sedentary time (ST) have not been tested. This study aimed to examine the independent association of personal, social and environmental factors with objectively-measured sedentary time in a large, heterogeneous sample of US adolescents.

Methods:

Adolescents (N=880, age 14.1 \pm 1.4) recruited from neighborhoods varying in walkability and income in two regions of the US completed a survey and wore an Actigraph accelerometer for 7 days. Average daily minutes <100 counts per minute was the outcome. Survey items included child and parent demographics, self-efficacy for reducing ST, enjoyment of ST, pros and cons of reducing ST, parent ST, presence of others during ST, ST rules, having a TV in the bedroom, ST-related personal electronics, the Neighborhood Environment Walkability Scale (Youth; NEWSY) and GIS walkability index. Mixed effect linear regression analyses adjusted for census block group. Final models retained all significant variables, adjusting for accelerometer measured PA and wear time.

Results:

The final model included child age and gender, ST enjoyment, parental ST, personal electronics, and TV in the bedroom. All these variables remained significant ($p < .025$) except for gender. Reported and GIS environment variables were not related to ST. All variables had a positive relationship with ST except TV in the bedroom.

Conclusions:

Individual-level, psychosocial, interpersonal factors, and home, but not neighborhood, environments are related to adolescent ST. Intervention should therefore consider addressing each level of the ecological model.

P398

Built environment influences on healthy eating and active living: A NEWPATH to energy balance

Authors:

Lawrence Frank, Josh van Loon, Pat Fisher, Mary Thompson, Leia Minaker, Kim Raine

Purpose:

To apply an energy balance approach to explain obesity of adults across a range of income, age, and walkability levels. This approach involves simultaneously evaluating impacts of diet (energy in) and physical activity (energy out) on body

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mass index (BMI), and was made possible through the unique study design of the Neighbourhood Environment in Waterloo Region: Patterns of Transportation and Health (NEWPATH) study.

Methods:

The sample for this study consists of 532 adults that participated in the NEWPATH study. Accelerometers were used to objectively measure physical activity, and food consumption data captured in a travel diary was used to calculate a Healthy Eating Index (HEI). Built environment supports for physical activity were captured using a Walkability Index, while those for healthy eating were gauged by Nutrition Environment Measures (NEMS) scores. Pathways from the built environment to behavior (walking and eating) to BMI were simultaneously assessed using path analysis.

Results:

Results indicate that walkability is a significant predictor of average daily minutes of moderate to vigorous physical activity ($p < 0.05$), and BMI ($p < 0.005$). In contrast, the NEMS food environment measures neither significantly predict the HEI or BMI.

Conclusions:

The results highlight the importance of walkability in influencing BMI. The finding that the food environment does not significantly predict BMI may be a result of limited environmental variability in the Waterloo Region. The NEWPATH study provides an innovative model for the integration of dietary, transportation, physical activity, built environment and body weight data that municipalities can use to create local evidence bases.

P399

Food outlet proximity to home and change in socioeconomically disadvantaged children's fruit and vegetable intake

Authors:

Janet Standen-Holmes, Lukar Thornton, David Crawford, Kylie Ball

Purpose:

Local food environments influence access to both healthy and unhealthy foods. This study aimed to examine whether the food environment within residential neighbourhoods was related to three-year changes in fruit and vegetable intake amongst children living in socioeconomically deprived areas.

Methods:

Mothers of 684 Australian children 6-12 years of age (mean 9.5, SD 2.2) living in socioeconomically deprived areas reported their child's fruit and vegetable intake (serves/day) in 2007/8 (T1), and 364 completed the follow up survey in 2010/11 (T2, mean age 12.3, SD 2.2). Distance to the nearest supermarket, greengrocer, and fast food restaurant was measured along the road network as driven by car from the child's home, and ANOVAs were conducted to assess their relationship to change (increased, maintained, decreased) in children's fruit and vegetable intake from T1 to T2.

Results:

No significant difference was found between mean fruit and vegetable intake in T1, (4.2 servings per day SD 1.8) and T2, (4.3 servings per day SD 1.9). No association was found between individual changes in fruit and vegetable intake and proximity of child's home to fast food restaurants, supermarkets or greengrocers.

Conclusions:

The lack of significant associations observed between proximity to stores and change in children's fruit and vegetable intakes in this sample may be due to the small magnitude of change observed over three years. Future research is needed to determine those environmental and other factors that lead to changes in fruit and vegetable consumption amongst socioeconomically disadvantaged children.

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P400

Changes in neighborhood built/social features and odds of PA

Authors:

Akilah Dulin-Keita, Lonnie Hannon, Olivio Clay, Ingrid Adams, Michelle Rogers

Purpose:

To examine whether changes in neighborhood built/social features are related to neighborhood-based physical activity (PA) in a socioeconomically disadvantaged community.

Methods:

We obtained data from a community undergoing revitalization as a result of HOPE VI federal funding. We recruited 184 black participants and retained 142 (77%) at six-month follow-up. For analyses, we included participants informative for all predictors (N = 127). Participants self-reported neighborhood measures (PA, disorder, walkability, aesthetics) and safety and PA opportunities related to HOPE VI (developed from formative research and measured at follow-up only), age, sex and education. We examined logistic regression models with variables entered in 6 blocks. We eliminated non-significant blocks.

Results:

Participants averaged 45 years of age (SD 14.0) and 50% male. Block 1 PA participants at baseline were 4 times more likely to be PA at follow-up ($p < 0.01$). Block 2 Males were 3 times more likely to be PA ($p < 0.01$). Baseline activity remained significant. Block 4 Change in neighborhood walkability increased PA by 17% ($p < 0.05$), sex and baseline PA retained significance. Block 5 Increased safety related to HOPE VI was not significant, changes in walkability remained significant. Sex and baseline PA remained significant. Block 6 PA related to HOPE VI increased odds of PA by 43% ($p < 0.01$). Baseline PA retained significance.

Conclusions:

Findings suggest that neighborhood changes may influence PA-related behaviors. Additional research is needed to build upon these early findings.

P401

Perceived environmental barriers as a predictor of step count changes in older adults

Authors:

Khalisa Bolling, Katie Crist, Lu Wang, Suneeta Godbole, Kevin Moran, Shahrokh Golshan, Jacqueline Kerr

Purpose:

To investigate the relationship between environmental perceptions and step counts in older adults living in retirement communities.

Methods:

Older adults (average age 83) were recruited from 11 retirement communities randomized to an attention control condition or a walking intervention that addressed environmental barriers. 7-day step counts were measured at baseline and 3 months by accelerometry. Participants completed surveys at baseline about their satisfaction with their walking environment, perceived barriers, and fear of falling in specific environments. A mixed model regression analyses, adjusting for site, age, gender, education, marital status, and baseline step counts, examined the interaction between environmental perceptions and the intervention on daily average step counts at 3 months.

Results:

At baseline, those with less satisfaction, more barriers and greater fear had significantly ($p < .05$) fewer step counts. There was no interaction between barriers or satisfaction with the intervention, i.e. regardless of baseline perceptions participants increased their steps significantly ($p < .05$). There was a significant interaction ($p < .001$) between fear of

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falling and the intervention indicating those with greater fear were less likely to increase their steps. In the control condition, step counts decreased equally in those with high and low fear of falling.

Conclusions:

Older adults with negative perceptions of their community environment increased their steps in an intervention that provided environmental supports such as maps, step counts, and counseling to overcome barriers. Further work is needed to increase steps in those most afraid of falling.

P402

Development of an abbreviated streetscape audit tool and its relation to active transportation in four age groups: MAPS-Abbreviated

Authors:

Kelli L. Cain, James F. Sallis, Terry L. Conway, Kavita A. Gavand, Rachel A. Millstein, Carrie M. Geremia, Lawrence D. Frank, Brian E. Saelens

Purpose:

Microscale streetscape features (e.g., sidewalks) have been shown to impact physical activity (PA) and are more modifiable, yet less-studied, than macroscale walkability. An abbreviated version of the Microscale Audit of Pedestrian Streetscapes (MAPS) tool was developed and evaluated in relation to active transport.

Methods:

The full 120-item MAPS assesses attributes of street design, transit stops, sidewalks, and street crossings. A 60-item version was developed based on item associations with PA and feasibility. MAPS was completed along a .25 mile route from participant homes toward the nearest non-residential destination for children (n=758), adolescents (n=897), younger adults (n=1655), and older adults (n=367). Active transportation was measured with validated age-appropriate surveys. Mixed model regressions were conducted for MAPS subscales and an overall score, adjusted for demographics, spatial clustering, and GIS-based macro-level walkability.

Results:

Fifty-eight percent of all MAPS-Abbreviated items and subscales were significantly associated with active transport (40.7% for adolescents, 51.9% for children, 70.4% for younger/older adults). Subscales related in all age groups were restaurants/entertainment along the route, streetscape amenities (e.g., street lights), buffer between street and sidewalk, and a combination of taller buildings and shorter building-setbacks from the sidewalk. Overall scores were related to active transportation in all age groups ($p < .01$ in adolescents, $p < .001$ in children and adults) and correlated with the full MAPS overall score $r = .89$.

Conclusions:

MAPS-Abbreviated is shorter, easier to use and shows similar associations with active transport compared to the full MAPS. It offers a more feasible option for use by community partners as well as researchers.

Adolescent Physical Activity & Nutrition

P403

Associations between adolescents' affects and perceived exertion during moderate-intensity exercise

Authors:

Svetlana Bershadsky, Priel Schmalbach, Margaret Schneider

Purpose:

Supporting youth physical activity (PA) participation requires an understanding of what factors underlie affective responses to exercise. We examined the relationship between adolescents' ratings of affect and perceived exertion (RPE) during moderate-intensity exercise, and the potential moderating roles of personality, PA enjoyment, and body mass index (BMI).

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Methods:

Adolescents (n = 109; mean age = 11.06, 49.5% male) reported affect (FS) and RPE every three minutes during a 30-minute moderate-intensity exercise task, and completed measures of PA enjoyment (PACES) and personality (BIS/BAS). Participants were categorized as normal weight or overweight/obese, and as low or high on enjoyment of PA, BIS, and BAS.

Results:

RPE was negatively associated with FS during the last third of exercise among adolescents who were overweight/obese, low on PA enjoyment, high BIS and/or low BAS ($-.296 < r < -.479$, $ps < .05$). During this latter portion of exercise, no group differences in absolute RPE were evident; however, affect was more negative in low PA enjoyment and high BIS adolescents.

Conclusions:

Perceived exertion and affect at the end of exercise are related among adolescents with low PA enjoyment and/or sensitivity to cues of reward and among those with high BMI and/or sensitivity to cues of punishment, and adolescents with high BIS or low PA enjoyment have more negative affective responses overall. Since affective change experienced toward the end of acute exercise is particularly important for its retrospective evaluation, these subgroups are at elevated risk for developing a negative affective association with exercise and becoming sedentary.

P404

A school based study of time trends in food habits and their relation to socio-economic status among Norwegian adolescents 2001-2009

Author:

Anne-Siri Fismen

Purpose:

In recent years, adolescents' food habits have become a major source of concern, and substantial policy and intervention efforts have been made to improve young people's food habits. Particular attention has been devoted to the social gradient in food habits, aiming to reduce dietary inequality. However, few internationally published studies have evaluated trends in teenagers' food habits, or investigated how dietary inequalities develop.

Methods:

We used Norwegian cross-sectional data from the international Health Behavior in School-Aged Children (HBSC) study, collected via three nationally representative and comparable questionnaire surveys in 2001, 2005 and 2009. Food habits were identified by students' consumption of fruit, vegetables, sweets and sugar rich soft drink. Socio-economic status (SES) was measured with the Family Affluence Scale.

Results:

The analyses indicated an overall positive trend in food habits among adolescents in Norway, with improved consumption of fruit and vegetables during 2001-2005, and reduced intake of sweets and soft drink during the periods 2001-2005 and 2005-2009. At all survey points, students with higher SES reported eating more fruit and vegetables than did students with lower SES. Our analyses indicated that the socio-economic differences remained unchanged during the years of data collection. We found no significant association between SES and intake of sweets and sugar-added soft drink.

Conclusions:

The study identifies an overall improvement in diet among adolescents over a period characterized by onset and ongoing initiatives targeting young people's food habits. However, the observed socio-economic gradient in fruit and vegetable consumption remained unchanged.

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P405

A Western dietary pattern is prospectively associated with externalising behavioral problems in female adolescents

Authors:

Gina Trapp, Karina Allen, Lucinda Black, Gina Ambrosini, Peter Jacoby, Sue Byrne, Wendy Oddy

Purpose:

Whilst previous cross-sectional studies have reported associations between diet and mental health among adolescents, few prospective studies exist. The aim of this study was to examine prospective relationships between dietary patterns and mental health among adolescents participating in the Western Australian Pregnancy Cohort (Raine) Study.

Methods:

Self-report questionnaires were used to assess indicators of mental health (Youth Self Report externalising/internalising T-scores) and Western and Healthy dietary patterns (identified using factor analysis) at 14 (2003-2005) and 17 years (2006-2008). Multivariate linear and logistic regression were used to assess relationships between dietary patterns and mental health, adjusting for total energy intake, dietary misreporting, baseline mental health, physical activity, body mass index, family functioning, family income and maternal education (2013).

Results:

Complete data were available for 746 adolescents. In females only, the Western dietary pattern z score at 14 years was positively associated with greater externalising behaviors at 17 years ($B = 1.91$; 95% CI 0.04, 3.78) and a greater odds of having clinically concerning externalising behaviors at 17 years ($OR = 1.90$; 95% CI 1.06, 3.41).

Conclusions:

This study showed that a Western dietary pattern was prospectively associated with externalising behaviors in adolescent females. The results highlight the potential role of diet in modifying mental health problems.

P406

Self-regulation and its association with self-reported leisure-time PA among Hong Kong Chinese adolescents

Authors:

Amanda Jane Pitkethly, Patrick WC Lau

Purpose:

Only 57.4% of 13-19 year old Hong Kong adolescents engage in three or more days of 30 minutes of moderate to vigorous activity weekly (Hong Kong Department of Health 2010). This study investigated 1) the association between self-regulation and leisure-time physical activity (LTPA) in Hong Kong Chinese adolescents, and 2) whether higher self-regulation scores (using median as cut-off) are associated with more LTPA.

Methods:

Four hundred and eighty adolescents (11 - 19 years; mean age = 14.93; 294 males), from three Hong Kong secondary schools participated. The cross-sectional design used the short Chinese self-regulated learning self-report scale, which assessed planning, effort, self-monitoring, self-evaluation, reflection and self-efficacy (Cronbach's α subscales .72 to .89; ICC subscales .69 to .82); and the established Godin leisure-time exercise questionnaire.

Results:

Hierarchical multiple regression (HRM) analysis found that a model containing all self-regulatory variables explained a small but significant amount of LTPA (5.4%) in the whole adolescent group. High self-regulation scores were associated with higher LTPA levels, and a significant HRM model, for the high self-regulation group, explained 12% of vigorous LTPA. In this model reflection emerged as a significant predictor ($p < .05$).

Conclusions:

Better self-regulated adolescents reported significantly more LTPA, and appear to reflect more than less self-regulated adolescents, which suggest that they may be more aware of their strengths and weaknesses and able to translate this knowledge into future action. Considering that self-regulation is amenable to training, future research should focus on teaching self-regulatory strategies and assessing their impact on adolescent LTPA.

P407

Differences in adolescent dietary behaviors by SES

Authors:

Karen Cullen, Jayna Dave, Ann Chen

Purpose:

Little is known about how socioeconomic status (SES) affects dietary intake among adolescents. This study assessed whether dietary behaviors of 12-17 year old adolescents differed by SES, using eligibility for free or reduced price (FRP) school meals as a measure of SES.

Methods:

After parental consent was obtained, 391 adolescents used an online survey to report demographics, height, weight, and FRP status. They also reported frequency of consumption of 100% juice, fruit, vegetables, sugar sweetened beverages (SSB), and milk over the past week using the Youth Risk Behavior Survey questions. Mean daily intakes were compared by FRP meal status (yes/no) using analysis of covariance controlling for gender, age, ethnicity, and BMI.

Results:

Most participants were Black (40%) or White (38%); 45% were male; 33% were overweight/obese; and 33% were from low SES families based on eligibility for FRP meals. Participants eligible for FRP meals (low SES) reported greater consumption of SSB (1.4 vs. 0.94 times/day; $p < 0.001$) but less milk (0.75 vs. 1.15 times/day; $p < 0.001$), compared with those not receiving FRP meals (high SES). There were no differences in juice, fruit or vegetable consumption.

Conclusions:

SES influenced beverage intake in this group of adolescents. Low SES adolescents reported significantly greater frequency of SSB and lower frequency of milk consumption. However, all the adolescents reported inadequate milk consumption compared to the recommendations. Future research, in addition to school-based, should target family and environmental influences on beverage consumption in order to improve dietary intakes among adolescents.

P408

Change in screen time on week and weekend days in Brazilian students

Authors:

Kelly Samara Silva, Adair da Silva Lopes, Valter Cordeiro Barbosa Filho, Jorge Bezerra, Elusa Santana A de Oliveira, Markus Vinicius Nahas

Purpose:

Economic and technological improvements can help increase screen time use among adolescents, but evidence in developing countries is scarce. The aim of this study was to examine changes in TV watching and computer/video game use patterns on week and weekend days after a decade (2001 and 2011), among students in Santa Catarina, southern Brazil.

Methods:

A comparative analysis of two cross-sectional surveys that included 5028 and 6529 students in 2001 and 2011, respectively, aged 15 to 19 years. The screen time use indicators were self-reported. Confidence intervals of 95% were used to compare the prevalence rates. All analyses were separated by gender.

Results:

After a decade, there was a significant increase in computer/video game use on weekdays (boys: from 24.4% to 16.9%; girls: from 22.1% to 15.1%) and on weekend (boys: from 42.7% to 26.5%; girls: from 31.1% to 14.8%). Inversely, a significant reduction in TV watching on weekdays (boys: from 31.4% to 12.2%; girls: from 33.9% to 18.3%) and on weekend (boys: from 52.4% to 29.1%; girls: from 58.7% to 32.2%) was observed, with a similar magnitude to the change in computer/video game use. The worst trends were identified on weekend days.

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Conclusions:

The decrease in TV watching after a decade appears to be compensated by the increase in computer/video game use, both in boys and girls. Interventions are needed to reduce the negative impact of technological improvements in the lifestyles of young people, especially on weekend days.

P409

The significance of PA contexts on PA behaviors of Hispanic adolescents

Authors:

Alexander Vigo, Samuel R. Hodge, Shafa Al-Showk

Purpose:

Hispanic adolescents have reported reduced physical activity (PA) levels, which tend to decrease throughout the week. The purpose of this study was to examine the association between PA contexts and PA behaviors on Hispanic adolescents living in Puerto Rico.

Methods:

Using a cross-culturally validated Visual 7-Day PA Recall (V7DPAR), data were collected to examine the PA frequency, mode, duration, and contexts. A total of 637 participants attending middle and high schools across Puerto Rico completed the V7DPAR.

Results:

The participation in organized sports correlated with (a) days participating in PA [$r=.202$, $p<.001$], (b) running [$r=.229$, $p<.001$], and (c) participation in 30-59 minutes of PA [$r=.172$, $p<.001$]. Physical education was associated with (a) days participating in PA [$r=.269$, $p<.001$], (b) volleyball [$r=.333$, $p<.001$], (c) moderate physical activity [$r=.256$, $p<.001$], and (d) participation in 30-59 minutes of PA [$r=.477$, $p<.001$]. Participation in personal physical activities linked with (a) days participating in PA [$r=.558$, $p<.001$], (b) walking [$r=.578$, $p<.001$], and (c) moderate PA [$r=.553$, $p<.001$].

Conclusions:

It is evident that different physical activity contexts play an important role in the engagement of a variety of physical activities. Therefore, multi-dimensional and culturally relevant approaches may be needed to increase opportunities for Hispanic adolescents to reach at least 60 minutes of PA most days of the week. These findings also have implications for public health professional and policymakers.

P410

Identifying barriers to PA among low-income tweens

Author:

Debra Palmer

Purpose:

The objective of this study was to identify barriers to physical activity among the low-income Tweens (Children in grades 6-8).

Methods:

This exploratory study included 534 middle-school students from schools in which 350% of students received free-or-reduced price lunches. A self-reported survey of 154 items was developed based on extensive literature review and prior research work. It assessed 110 potential barriers using a 5-point Likert scale ranging from "it never stops me from being physically active" to "it always stops me from being physically active". The survey was administered at 13 sites and completed in 20-30 minutes. Statistical analyses included univariate frequency distributions and measures of central tendency.

Results:

Participants ($n=443$) who completed the survey were 67% 6th-graders, 46.7% males, 51.7% Blacks, and 16.3% Hispanic/Latinos. At least 25% of students reported the following as barriers (as sometimes, often or always; 3-5 on the scale):

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Spending time with family and friends ($m=3.97\pm0.91$), ice outside ($m=3.97\pm0.91$), raining outside ($m=3.85\pm0.89$), being lazy ($m=3.77\pm0.84$), feeling like goofing off ($m=3.77\pm0.86$), spending time on the computer ($m=3.73\pm0.85$), watching TV ($m=3.69\pm0.84$), talking online or on the phone or texting ($m=3.68\pm0.84$), feeling tired ($m=3.62\pm0.81$), doing something more fun ($m=3.61\pm0.86$), and being hot outside (3.51 ± 0.77). Less than 5% reported the following as barriers: Smoking ($m=3.86\pm1.87$), drinking alcohol (3.86 ± 1.30) and no gym class in school ($m=3.26\pm1.20$).

Conclusions:

These barriers likely prevented low income children from engaging in regular physical activity and may be considered while designing physical activity programs for middle school Tweens.

P411

What influences PA in adolescent girls? Comparison between self-report and pedometer-based measures

Authors:

Ling-Ling Lee, Yung Liao, Dilw Fanaw

Purpose:

To examine correlates of self reported and pedometer measured physical activity among adolescent girls in a middle-income country.

Methods:

A total of 155 adolescent girls were recruited with mean age 16.3 ± 0.5 years, who reported their time spent in physical activity and sedentary behavior; self-rated health status; exercise self-efficacy; perceived benefit and barriers of exercise; social support from tutors, peers, and family; perceived depression via face-to-face interviewing. Participants' number of weekly steps were collected by an electronic pedometer. Body Mass Index, weight circumference and cardiorespiratory fitness were objectively measured. Multiple regression were employed to analyze correlates of physical activity among participants.

Results:

Sedentary time in weekday and self-efficacy were significantly associated with self reported physical activity, whereas cardiorespiratory fitness, self-efficacy, perceived benefits and barriers were found to be significantly associated with pedometer measured physical activity. No social factors were observed to be correlated to physical activity in this group of adolescent girls.

Conclusions:

There are similarities and differences of correlates in self reported and pedometer measured physical activity in adolescent girls. Exercise self-efficacy was found to be an important predictor of physical activity, regardless of type of physical activity measurement.

P412

Nutrition facts labels: Young people's understanding and use of nutrition information

Authors:

Erin Hobin, David Hammond, Gail McVey, Judy Sheeshka

Purpose:

Adolescent and young adults are important populations to target for nutrition interventions given their relatively poor diets. These populations are also in a period of transition, characterized by increasing independence, a growing role in food shopping, and the development of long-term eating patterns that can track throughout adulthood. Nutrition Facts Labels are the most prominent source of nutrition information for adults in Canada; yet, little is known about how young people comprehend and use these tools. This research sought to examine how young people in Canada engage with and construct meaning from Nutrition Facts Labels when choosing pre-packaged foods, and test modifications to these tools. Study 1 consisted of an online survey with a sample of 2,000 participants ages 16-24 from across Canada, including a between-group experiment to test the efficacy of the current and modified Nutrition Facts Labels on comprehension and use of serving size and percentage daily value information. Study 2 used qualitative methods

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with a sample of 26 participants ages 16-24 to explore the process by which young people comprehend and use serving size and percentage daily value information on the current and modified Nutrition Facts Labels. These data were collected concurrently. The results from the two sub-studies were triangulated during interpretation to facilitate a more complete understanding. Results will inform regulatory changes to the Nutrition Facts Label in Canada and other jurisdictions, as well as provide evidence to support interventions for improving young people's understanding and use of Nutrition Facts Labels when choosing foods.

P413

Food messages in adolescents everyday life: Result from a role play

Authors:

Jenny Rendahl, Peter Korp, Marianne Pipping Ekström, Christina Berg

Purpose:

Adolescents are faced with different messages about food, and have the pressure of making choices where they take responsibility for their health and live up to social expectations. From a health promoting perspective it is interesting to explore messages about food that they are confronted with. Our intention was to study this by using role-play.

Methods:

31 adolescents (11 male, 21 female) divided into five groups, participated in role-play and focus group interviews. In the role-play, the participants portrayed actors that they perceived mediate messages about food in their everyday life. First they negotiated roles that represented important dietary influences, then they planned, purchased and prepared a meal together. In the focus group, they further expanded and explained what had been chosen, said and done.

Results:

Media, home economics teachers, parents and friends were presented as most important actors in mediating food messages. Messages from parents were described as holistic and caretaking, considering many aspects of the diet; taste, nutrition, economy etc. Messages from home economic teachers, school canteen personnel, and media were to lesser extent multidimensional and more exhorting, while messages from school nurse, McDonalds, friends, celebrities, coaches and weight watchers were one-dimensional. For example, were coaches depicted as only focusing on protein to promote performance.

Conclusions:

This study illuminates different messages that needs to be taken into account in health promotion activities for adolescents, it also shows by who and how these messages are mediated, and that role-play is an applicable method to explore this.

P414

Is reward sensitivity related to the snack consumption in adolescents?

Authors:

Nathalie De Cock, Wendy Van Lippevelde, Jolien Vangeel, Lea Maes, Steven Eggermont, Kathleen Beullens, Caroline Braet, John Van Camp

Purpose:

The aim was to examine associations between reward sensitivity (RS), punishment sensitivity (PS) and snack consumption of adolescents.

Methods:

Self-reported data on daily snack intake and reward sensitivity of Flemish adolescents (n=545; age: M=14.6, SD=0.8; 48.1% boys, 45.9% low SES) were collected through a cross-sectional survey. Linear regression analyses (adjusted for covariates) were used to assess associations between predictor variables RS and PS and daily intake of sugar sweetened beverages (SSB) and snacks. RS was evaluated via total Behavioral Approach System (BAS), BAS fun, BAS reward responsiveness (BAS RR) and BAS drive scores. PS was evaluated by means of Behavioral Inhibition System (BIS) scores. Daily

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snack intake was evaluated by daily intake of healthy (sum of fruit, dried fruit, nuts and raw vegetables), overall unhealthy (sum of sugar-rich, fat-rich and sugar- & fat-rich snack intake), sugar-rich, fat-rich and sugar- & fat-rich snacks.

Results:

Firstly positive associations were found for SSB consumed per day with total BAS ($p=0.027$), BAS drive ($p=0.001$) and BAS fun ($p=0.027$) scores, whereas a negative association was found with BIS ($p=0.003$) scores. Secondly intake of overall unhealthy snacks was solely positively related to BAS ($p=0.009$) drive scores. Thirdly intake of sugar-rich snacks was only positively associated with BAS ($p=0.045$) drive scores. Fourthly and finally intake of fat-rich snacks was solely negatively associated with BIS ($p=0.029$) scores.

Conclusions:

Associations of RS and PS with snack consumption were found. SR was positively associated with snack consumption whereas SP was negatively associated with snack consumption.

P415

The associations between state bans on soda only and adolescent substitution with other sugar-sweetened beverages

Authors:

Daniel Taber, Jamie Chiqui, Steven Kelder, Frank Chaloupka

Purpose:

In the United States, many state laws have banned the sale of soda in high schools, but adolescents overall are consuming greater quantities of other sugar-sweetened beverages (SSBs) such as sports drinks and energy drinks. This study examined whether students consumed more non-soda SSBs in states that banned the sale of soda.

Methods:

Student data on consumption of various SSBs, and in-school access to SSBs, were obtained from the National Youth Physical Activity and Nutrition Survey (NYPANS), conducted in 2010. Student data were linked to state laws regarding the sale of soda in school in 2010. Zero-inflated negative binomial models were used to determine if laws that banned soda in schools were associated with students' self-reported consumption of diet soda, sports drinks, energy drinks, coffee/tea, or other SSBs. Models were adjusted for race/ethnicity, sex, grade, home food access, state median income, and Census region.

Results:

Students tended to consume more servings of sports drinks, energy drinks, coffee/tea, and other SSBs if they resided in a state that banned soda in school. This association was observed primarily among students whose school provided vending machines that sold other SSBs. Intake was generally not elevated where states banned soda and schools did not have SSB vending machines.

Conclusions:

State laws that ban soda but allow other SSBs may lead students to substitute other non-soda SSBs. Additional longitudinal research is needed to confirm this. Elevated SSB intake was not observed when both states and schools took steps to remove SSBs from school.

P416

Sedentary behavior and sleeping time in athletic and non-athletic Saudi youth

Author:

Mohammad Alahmadi

Purpose:

The aim of this study was to compare sedentary behaviour and sleeping time between athletic soccer players ($n = 96$, age 17.0 ± 1.1 years ($M \pm SD$)) and non-athletic individuals ($n=106$, age 16.1 ± 1.5 years). In both groups, weight and height were measured and body mass index (BMI) was calculated. A self-report sedentary behaviour questionnaire was

also used to assess sleeping time and time spent in watching television (TV), computer/Internet use, electronic games playing, and total sedentary time. The results showed that there was no significant difference between athletes and non-athletes in weight (60.5 ± 9.3 vs. 57.6 ± 17.2 kg), height (168 ± 6.6 vs. 166 ± 8.2 cm), and BMI (21.3 ± 2.4 vs. 22.6 ± 5.5 kg/m²). A significant difference in total sedentary time was found between athletes (311 ± 195 min/day) and non-athletes (411 ± 241 min/day). The results also showed that 77% of soccer players spent > 2 h/day in screened-based sedentary behaviour compared with non-players (85%). Sleep duration was significantly ($p = 0.046$) higher among the soccer players ($7.46 (1.27)$ hr/day) compared with non-players ($7.05 (1.61)$ hr/day). 67% of the soccer players had less than 8 hours of daily sleep time compared with 59% of non-players. Age was positively associated with sedentary and sleeping time in athletic group ($r = 0.28$, $p = 0.007$; $r = 0.22$, $p = 0.038$) and was negatively associated with sleeping time in non-athletic group ($r = -0.25$, $p = 0.011$). It is concluded that although athletic youth spent less time in sedentary activity compared with non-athletic youth, they tend to be more sedentary as they get older.

P417

Eating behaviors, physical activities and risk of obesity among adolescent girls: A study in India

Authors:

Nivedita Som, Susmita Mukhopadhyay

Purpose:

To find out the association of obesity with eating behaviors and physical activities among a group of Indian urban adolescent girls.

Methods:

The present cross sectional study involved a total of 1631 adolescent girls of Kolkata. Data on eating behaviors (intake of carbohydrates, vegetables, fruits, dairy products, fried foods, soft drinks and ice cream and weight reducing eating practices) and physical activities (regular exercise, dance and sports) were collected using standard pre tested questionnaires. Anthropometric measurements (height and weight) were taken following standard techniques. BMI for age Z scores for girls were calculated using the growth reference data of the World Health Organisation. Both bivariate and multivariate statistics were used to analyse the data.

Results:

More than 30% of the study participants were overweight and obese. Girls were observed to follow unhealthy measures of weight reduction (42.3%), consumed high calorie foods (69.8%) and performed less physical activities (78.9%). Incidence of obesity among girls significantly increased with increase in consumption of high calorie foods, use of unhealthy measures of weight reduction and insufficient physical activities.

Conclusions:

The upcoming trend of being thin coupled with the rapid increase in fast food outlets possibly bring a change in attitude and practice of eating habits among Indian urban adolescent girls. Sedentary behaviors induce girls to become physically less active. Improper eating habits and sedentary behaviors are major causes for the increased risk of obesity among adolescent girls.

P418

Healthy weight in high school: Development of a community- and school-based intervention addressing energy-balance related behaviors

Authors:

Mette Toftager, Camilla Thørring Bonnesen, Mette Rasmussen, Pernille Due, Rikke Krølner

Purpose:

Life course models highlight times of transition such as the high school years as possible “windows of susceptibility”. Around 18% of Danish 16-20-year-olds are overweight or obese and the age group is characterised by unhealthy energy-balance related behaviors. Few interventions have used high school as a setting for obesity prevention. The purpose is

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to develop, implement and evaluate a sustainable high school- and community-based intervention to prevent unhealthy weight development among students.

Methods:

Development, implementation and evaluation of the intervention will be guided by the intervention mapping protocol. Environmental and educational strategies will address determinants of physical activity, sedentary behaviors, sleeping patterns and eating and meal habits including alcohol consumption. Based on baseline data from a nationwide high school cohort, 60 randomly selected high-risk schools will be randomized into intervention- and control groups. Data will be collected at the beginning (age: 16) and end of high school (Age: 19).

Results:

Preliminary needs assessment: Intervention strategies must be tailored to different types of high schools. For instance, students in technical and commercial high schools do not have access to courses or facilities for physical activity. Weight is a sensitive issue in this age group e.g. perceived body image seems to be a barrier for engaging in physical activity. We will pay special attention to this in order not to induce adverse intervention effects.

Conclusions:

The project will provide insights on effective strategies tailored to different types of high schools to promote healthy energy-balance related behaviors and healthy weight development among students.

P419

The outdoor MEDIA study: Outdoor advertising and availability of foods and beverages around schools

Authors:

Keryn E Pasch, Natalie S Poulos

Purpose:

To describe the outdoor food and beverage advertising environment and availability of foods and beverages around middle schools and high schools in Central Texas.

Methods:

All food and beverage (FB) advertisements (i.e., any sign or image that promoted a food or beverage product) and establishments (i.e. any location which sold foods or beverages) located within a half mile of 34 middle schools and 13 high schools were documented as part of the Outdoor MEDIA Project. Data collectors, using a reliable electronic data collection tool developed for the study, documented descriptive information and took a photo of each FB advertisement or location. Total and mean number of advertisements and establishments were then calculated for middle schools and high schools.

Results:

A total of 3,844 FB advertisements ($m=113.1$) and 458 establishments ($m=15.3$) were documented around the 34 middle schools. Around the 13 high schools, a total of 1,863 FB advertisements ($m=143.3$) and 153 establishments ($m=11.8$) were documented. Results will also be presented which compare FB advertisements and establishments by school socioeconomic status and visually depict findings using Geographic Information Systems data.

Conclusions:

Outdoor FB advertising around schools is pervasive. Given that many of the products in these advertisements promote low nutrient, energy dense foods and beverages, youth may be overexposed to these products on a daily basis as they travel to and from school. Additionally, foods and beverages are readily accessible within a half-mile of many middle schools and high schools, allowing students to immediately purchase the advertised products.

P420

Effect of ACIVITAL 2-yr-intervention program on screen time, PA and fitness according to weight status and fitness levels in adolescents

Authors:

Susana Andrade, Angelica Ochoa-Aviles, Carl Lachat, Greet Cardon, Silvana Donoso, Patrick Kolsteren

Purpose:

Compared to normal weight and fit adolescents, overweight and unfit adolescents are more likely to develop cardiovascular disease in adulthood. Despite this, there is insufficient evidence regarding the effectiveness of general school-based interventions in these high-risk groups. We assessed if overweight/obese and unfit adolescents responded differently to a school-based health promotion intervention compared to normal weight or fit adolescents.

Methods:

A cluster-randomized pair matched trial was performed in 20 urban schools located in Cuenca city -Ecuador (October 2009 to May 2012). Adolescents of grade 8 and 9 (12.3 and 13.3 years respectively) participated in the trial, which included an individual and environmental component. At baseline, the adolescents were classified into groups according to their BMI values in normal weight and overweight/obese and according to aerobic capacity scores in fit and unfit. Mixed linear model were used to assess the intervention effect on physical fitness (EUROFIT test battery), screen time (questionnaires) and physical activity (accelerometer).

Results:

The overweight/obese prevalence was 21.5% while the 84.8% of the adolescents were classified as unfit. The intervention effect on speed shuttle run ($\beta = -1.5$ s, $P = 0.03$), sedentary time ($\beta = -90.3$ min/day, $P < 0.01$) and light physical activity ($\beta = 55.5$ min/day, $P < 0.01$), was significantly higher in overweight adolescents compared to normal weight peers. In addition, the intervention effect on vertical jump was higher in unfit adolescents ($\beta = 2.43$ cm, $P = 0.02$) compared to their fit peers.

Conclusions:

A school-based culturally appropriate multi-component program is more effective in overweight/obese and unfit adolescents compared to normal weight or fit adolescents.

P421

Understanding perception of peer and maternal eating and PA behaviors of urban elementary school students participating in food, health & choices: A childhood obesity prevention program

Authors:

Rachel Paul, Matthew Graziose, Heewon Lee, Isobel Contento, Pamela Koch

Purpose:

To examine the relationship between children's own energy balance-related behaviors (EBRBs) and their perceptions of their mothers' and peers' EBRBs.

Methods:

Fifth-grade students ($n = 281$) in 4 New York City public schools completed a previously validated questionnaire (FHC-Q), which measured frequency of EBRBs, using an audience response system (ARS). Students also answered questions about their perceptions of their mothers' and peers' EBRBs. Relationships were examined using Pearson's correlations by gender.

Results:

For boys, there were significant correlations between their own fast food consumption and their perception of peers' consumption ($r = 0.434$; $P < 0.01$) and mothers' consumption ($r = 0.525$; $P < 0.01$). For girls, their own behaviors were correlated with their mothers' for fast food ($r = 0.451$; $P < 0.01$); processed packaged snack ($r = 0.496$; $P < 0.01$); fruit ($r = 0.431$; $P < 0.01$); and physical activity ($r = 0.428$; $P < 0.01$). For sweetened beverages, boys' intake was correlated with per-

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ceived peer consumption ($r=0.331$; $P<0.01$), while girls' were correlated with mothers' ($r=0.304$; $P<0.01$). For screen time, again boys' behaviors were correlated with their perception of peers' time spent on video and computer games ($r=0.265$; $P<0.01$), while girls' were correlated with their perception of mothers' screen time ($r=0.318$; $P<0.01$).

Conclusions:

A strong relationship exists between elementary school children's own EBRBs and those they perceive of peers and mothers, with some notable differences by gender. Girls EBRBs seem to be more correlated with their perceptions of their mothers' EBRBs, while boys seem to be more correlated with their perceptions of their peers' EBRBs. Targeting these influences in future obesity prevention studies, tailored to each or both gender, is warranted.

P422

Getting teens moving: Gender differences in school and community factors that predict PA among adolescents

Authors:

Carolyn Rider, Michael Biehl

Purpose:

Most adolescents do not get adequate physical activity (PA), defined as at least one hour of moderate to vigorous physical activity (MVPA) daily. Teen girls are less likely than boys to get enough PA. This study adds to the body of evidence-based strategies public health practitioners and policy makers can use to promote PA among adolescents by increasing opportunities to engage in PA. Specifically, the study assessed whether greater opportunities for PA at school and in the community predict increased frequency and duration of MVPA among adolescents, and whether predictors differ for teen boys and girls.

Methods:

CalTEENS is a biennial statewide telephone survey of California adolescents (12-17) conducted in English and Spanish. This study used hierarchical regression analysis with the 2012 CalTEENS sample ($N=1,035$) to examine if these factors predicted PA and if predictors varied by gender.

Results:

Frequency of PA (how many of the last seven days being physically active for at least 60 minutes) and duration of PA (total minutes of PA on the previous day) were both predicted by opportunities for PA ($p<.001$), and separate models by gender revealed different patterns for boys and girls. Most notably, household poverty status significantly predicted both PA measures for girls (but not boys), while neighborhood safety significantly predicted both PA measures for boys (but not girls).

Conclusions:

This study identified multiple school, after school, and community factors that predict adolescent MVPA. Findings varied by gender, suggesting that different strategies may be needed for boys and girls.

P423

Where does the time go? Patterns of daily PA in adolescent youth as measured by accelerometer

Authors:

Sarahjane Belton, Danielle Powell, Wesley O'Brien, Bronagh McGrane, Johann Issartel

Purpose:

The purpose of this study was to explore differences in daily physical activity (PA) patterns between adolescents meeting and not meeting the minimum 60-minute daily moderate to vigorous PA (MVPA) guideline.

Methods:

388 adolescents (11 - 13 years) were asked to wear an Actigraph accelerometer for a 9-day period. Data sets were included in analysis if participants had > 10 hours wear time for a minimum of 3 weekdays and 1 weekend day. Data was processed applying the Evenson et al. (2008) cut points to give average daily, weekday, weekend day, before school, lunch time, after school, and evening minutes of MVPA.

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Results:

Participants accumulated an average of 53 minutes of MVPA per day, and were significantly more active on weekdays than weekend days ($p < 0.001$). 65% of participants met the minimum 60-minute daily MVPA guideline. Both males and females were significantly less active in the evening compared to the other three time periods ($p < 0.001$). Participants that met the 60 minute PA guideline were significantly more active than those that didn't in the lunchtime, after school and evening periods ($p < 0.001$), but no significant differences were observed in the before school period.

Conclusions:

Understanding patterns of PA participation in youth should be a central concern in the development of targeted PA interventions. Findings suggest that school lunchtime, the period immediately after school, and the evening time, are time periods when inactive youth have scope to increase their PA levels.

P424

Improving psychological outcomes and autonomous motivation for healthy lifestyle behaviors in obese adolescents

Authors:

Ashley Fenner, Leon Straker, Kyla Smith, Erin Howie, Martin Hagger

Purpose:

To investigate the effectiveness of a family-based healthy lifestyle intervention based on self-determination theory aimed at enhancing psychological outcomes and autonomous motivation for healthy lifestyle behaviors in obese adolescents following exposure to modifications of instructor and parent need-supportive behaviors.

Methods:

The Curtin University's Activity, Food and Attitudes Program (CAFAP) was delivered across three waves staggered at 3-month intervals at three community sites. A total of 56 adolescent/parent pairs completed the 8-week intervention. Adolescent outcomes were measured using the Short Moods and Feelings Questionnaire; Paediatric Quality of Life - Teen Report; and modified versions integrating the Revised Behavioral Regulations and Exercise Scale, Integrated Regulation Scale for Exercise Behavior, and Perceived Locus of Causality for Diet to assess autonomous motivation for physical activity and healthy eating. Linear mixed models using bootstrapped standard errors were used to assess within-person changes in outcomes.

Results:

Adolescent health-related quality of life improved from pre- to post-program ($p < .001$), and improvements were maintained to 6-months post-program. Reductions in depressive symptoms were shown from pre- to post-program, but were only significant from pre- to 6-months ($p = .003$). Adolescent autonomous motivation for both physical activity and healthy eating improved pre- to post-program ($p < .003$), and improvements were maintained at 6-months.

Conclusions:

Exposing adolescents to an intervention targeting the modification of instructor and parent need-supportive behaviors can improve adolescent psychological outcomes and autonomous motivations to engage in physical activity and healthy eating behaviors.

P425

Relation of afterschool environment to adolescents' afterschool PA

Authors:

Christy Thornton, Terry Conway, Kelli Cain, Brian Saelens, Lawrence Frank, Karen Glanz, James Sallis

Purpose:

Most adolescent physical activity (PA) occurs after school, and schools could do more to promote afterschool PA. This study examined school environments and afterschool policies in relation to adolescent PA.

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Methods:

Participants were 889 adolescents aged 12-17 ($M=14.1$, $SD = 1.4$) from Seattle, Washington and Baltimore, Maryland regions (50.4% female; 33.7% nonwhite) studied during 2007-2012. Surveys assessed average days per week participants accumulated 60+ minutes of PA, excluding school PE, and frequency of PA on school grounds during non-school hours. The survey also assessed school policy/environmental factors including afterschool supervised PA, afterschool access to play areas/fields, and presence of sports facilities. Mixed regression models adjusted for study design effects, region, sex, age, ethnicity, vehicles/licensed drivers in household, and distance to school.

Results:

Adolescents' non-school PA was significantly associated with afterschool supervised PA ($t= 2.69$, $p=.007$), afterschool access to play areas/fields ($t= 2.84$, $p=.005$), and presence of sports facilities ($t= 2.03$, $p=.043$). Frequency of PA on school grounds during non-school hours was associated with afterschool supervised PA ($t= 4.12$, $p<.001$), afterschool access to play areas/fields ($t= 4.82$, $p<.001$), and sports facilities ($t= 3.636$, $p<.001$). An index of the three school policies/environments had the strongest associations with non-school PA ($t= 3.67$, $p<.001$) and use of school grounds afterschool ($t= 6.31$, $p<.001$).

Conclusions:

Policies and programs that increase afterschool opportunities for PA on school grounds through supervised PA and access to play areas, fields, and sports facilities may increase adolescents' afterschool PA and help adolescents achieve 60 minutes of daily PA.

P426

Time spent watching TV and food intake among adolescents

Authors:

Rose Autran, Sandra Abreu, Maria Fátima Pina, Jorge Mota, Maria Paula Santos

Purpose:

Literature has evidenced that sedentary activity, such as watching TV can be associated with unhealthy eating habits among adolescents. The aim of this study was to verify the relationship between the time spent on television viewing and dietary intake among adolescents.

Methods:

Adolescents ($n=384$, 58% girls) aged 14 to 18-years-old, enrolled at public schools in Porto municipality were evaluated. All adolescents were also evaluated in their anthropometric measures: Body weight and height. Cole's cut-points were used to categorize underweight/normal weight and overweight/obesity. Time spent watching TV was assessed with NEWS-Y survey. The dietary intake was assessed using a food frequency questionnaire adapted for Portuguese adolescents. Linear correlation was calculated.

Results:

The proportion of adolescents watching TV ≥ 2 hours/day was 27%. Positive correlations were found in underweight/normal weight adolescents between time spent watching TV and sweets/pastry ($r=0.192$; $p= 0.09$), sugar-sweetened beverages ($r=0.150$; $p= 0.03$), energy ($r=0.191$; $p= 0.08$) and total fat intake ($r=0.211$; $p= 0.03$). In overweight/obese adolescents we found a positive correlation with sweets and pastry intake ($r=0.348$; $p= 0.02$).

Conclusions:

Our study suggests that there is a relationship between higher consumption of low-nutrients, energy-dense foods and beverages and time spent watching TV among adolescents.

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P427

Fruit and vegetable intake and social cognitive correlates of Brazilian adolescent girls

Authors:

Ana Carolina Barco Leme, Sonia Tucunduva Philippi, Narelle Eather, David R. Lubans, Clare C. Collins

Purpose:

To examine potential social cognitive correlates of fruit and vegetable intake in Brazilian adolescent girls.

Methods:

This was a cross-sectional study with 159 girls (mean age= 16.3, SD= 1.3) enrolled in high schools of the city of São Paulo. Participants completed an adapted and validated self-report questionnaire to assess potential correlates of eating behaviors. Descriptive analyses, bivariate correlations and linear regression were conducted with differences considered significant at $p \leq 0.05$.

Results:

The intake of fruit and vegetable was 2 portions for each group, less than the Brazilian recommendation for this population. Linear regressions showed positive correlations to healthy weight control behaviors ($\beta=0.25$, $p=0.01$), behavioral strategies for healthy eating ($\beta=0.27$, $p=0.00$) and availability of fruit and vegetables at home ($\beta=0.33$, $p=0.00$).

Conclusions:

The potential social cognitive correlates to fruit and vegetable intake were related to behavioral strategies, as well as benefits and barriers, and the situation for the intake. The results of the current study have implications for interventions designed to promote fruit and vegetable consumption in adolescents and suggest that these aspects should be included as targets for change, particularly with a diverse sample of adolescents.

P428

Patterns of moderate-to-vigorous physical activity (MVPA) among middle-school students by gender and ethnicity

Authors:

Priel Schmalbach, Svetlana Bershadsky, Margaret Schneider

Purpose:

Knowledge of youth physical activity (PA) patterns throughout the week is helpful to plan effective PA interventions. The purpose of this study was to determine time spent in moderate-to-vigorous PA (MVPA) across a typical academic week, with specific attention to activity on weekends, weekdays, outside of school, in school (PE, lunchtime, and non-lunch/PE time), and differences by gender and ethnicity.

Methods:

Non-athlete sixth grade students ($N=109$; age=11.06[0.44]; BMI_z=66.79[31.04]; 50% male; 50% Latino, 14% African American, 17% non-Hispanic White). Actigraph accelerometers (≥ 3 valid week days, ≥ 1 valid weekend day; Romanzini (2012) cutpoints; triaxial; 15 sec epochs) were used to determine time in MVPA.

Results:

Average MVPA was greater on weekdays compared to weekend days (84 vs. 72 min, $p<0.001$). Of weekday MVPA, a greater quantity was accrued outside of school compared to during school (48 vs. 36 min, $p<0.001$). Lunchtime and PE provided 17% and 37% of total school MVPA. Girls engaged in fewer minutes of MVPA compared to boys across all segments of the day ($p<0.005$) except for non-lunch/PE time. African Americans engaged in greater MVPA compared to other ethnicities, particularly on weekends ($p<0.005$).

Conclusions:

Regardless of gender and ethnicity, participants obtained recommended levels of MVPA (>60 min per day), suggesting that maintenance should be the focus of PA interventions in sixth grade students. This study supports the well-characterized gender and ethnic disparity in MVPA. Future research should identify sources of weekday MVPA not accounted for by PE and lunchtime, since these amounts were substantial.

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P429

Dietary messages for overweight and obese adolescents can be targeted using time of day and day of week consumption patterns

Authors:

Kyla Smith, Leon Straker, Deborah Kerr, Anne Smith, Ashley Fenner, Erin Howie

Purpose:

To analyse consumption patterns of overweight and obese adolescents by time and day of week to identify opportunities for more consumption of fruit and vegetables and less consumption of junk food.

Methods:

Three-day food records from 61 overweight adolescents were analysed for serves of fruit, vegetables and junk food (fast food, sugar-sweetened beverages and 'other' junk) by time of day and day of week for males and females. Negative binomial regression and binary logistic regression using generalised estimating equations were used to compare likelihood of consumption of each food group between time periods.

Results:

Significant differences were observed in consumption of fruit, vegetables and junk food across time and day, with unique patterns identified for males and females. For example, fruit consumption was more likely on a weekday than a weekend day for males (OR=2.5, P=.034), and females consumed the greatest amounts of fruit at school (IRR=7.5, P<.001). Junk food examples include increased consumption of sugar-sweetened beverages on weekends than weekdays for males (IRR= 3.3, p=.001) and increased likelihood of fast food consumption at dinner on a weekend day for females (OR=9.6, P=.042). Example targeted messages include: Add fruit to breakfast on school days and vegetables to weekend breakfast/brunches, as well as avoiding fast food on the weekend.

Conclusions:

Consumption patterns split by time of day and day of week can be used to develop targeted, evidence-based dietary messages to increase fruit and vegetable consumption and decrease junk food consumption in overweight and obese adolescents.

P430

Negative effects of adolescents' chronic stress on emotional eating, vegetable consumption and high-calorie, low-nutrient dietary intake

Authors:

Eleanor Tate, Donna Spruijt-Metz, Mary Ann Pentz

Purpose:

In adult women, chronic stress has been associated with increased preference for high calorie foods. However, no research has examined longitudinal effects for adolescents. This study tested the longitudinal effects of chronic stress on subsequent high-calorie, low-nutrient (HCLN) food intake, as well as fruit/vegetable (F/V) intake, mediated by emotional eating.

Methods:

Participants were 979 adolescents, 52% female, 9.26 (\pm 0.48) yrs., 28% Hispanic, 24% obese and 25% free/reduced lunch. Chronic stress (6-item, Cohen Stress Scale), Emotional Eating (6-item, Meanings of Eating scale), HCLN intake (5-item, ex., chips, donuts) and F/V intake (7-item, ex., greens, fruit juice) were measured. Structural equation modeling was used to assess effects of a latent stress factor (Perceived stress at the beginning and end of students' 4th grade year) on emotional eating 1 year later, and HCLN and F/V intake 2 years later.

Results:

Adjusting for child gender, ethnicity, and BMI z-score, chronic stress had direct effects on HCLN ($b = 0.101$, $p = 0.06$) and vegetable intake ($b = -0.138$, $p = 0.02$), and an indirect effect on HCLN via emotional eating (indirect = 0.024, $p = 0.03$), $\chi^2(117) = 200.248$, $p = 0.00$, CFI = 0.968, RMSEA = 0.027, 95% CI = .020/0.033.

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Conclusions:

Experiencing enduring stress may increase child HCLN consumption by triggering emotional eating in adolescents as young as 10 years old. Obesity prevention programs may improve child diet by reducing negative effects of stress.

P431

Multisport/triathlon program as a mechanism to promote self-determined exercise among an over weight inner-city middle school Latino population

Authors:

Jeff Condit, Mark Caballero, Paula Papanek

Purpose:

This study fills holes in previous research in hopes to identify factors in physical activity programming that leads to self-sustaining increases in structured and leisure PA levels, an outcome measure thought to be more indicative of successful intervention, behavior change, future activity levels, and future health measures.

Methods:

Target cohort will be compared to peers inside and outside of a bootcamp program. Target cohort will receive 10 weeks of multisport fitness programming in addition to twice weekly bootcamp-style workouts and nutrition curriculum received during normal programming and regular PE classes during school. Multisport programming will consist of two sessions per week, divided into a short skills/goal-setting lecture (33%) and a strength/swim or bike/run team based training session (67%). Non-bootcamp students only receive PE classes 2-3 times per week with normal school curriculum.

Do children report higher levels of activity on Physical Activity Questionnaire for Older Children?

1. Do children score higher on Behavioral Regulation in Exercise Questionnaire?
2. Does Actigraph monitor data suggest higher activity levels upon termination of the program compared to baseline measurements?

If successful, we will be able to produce a 'manual' for the installation of a school based multisport team leading to increased self-determined exercise. We hope to understand what combination of elements are necessary in a guided fitness program to create sustained self-directed exercise upon termination of the program, specifically in at-risk/over weight/obese inner city Hispanic middle school population.

P432

Cultural adaptation and evaluation of social cognitive measures related to adolescent physical activity

Authors:

Ana Carolina Leme, Sonia Tucunduva Philippi, Deborah Dewar, David Lubans

Purpose:

The aim of this study was to culturally adapt and evaluate the reliability and factorial validity of modernized social cognitive measures relating to adolescents' physical activity behaviors.

Methods:

A questionnaire including constructs from Bandura's Social Cognitive Theory was culturally adapted to the Brazilian context and included the following scales: Self-efficacy, situation, social support, behavioral strategies, outcome expectations and expectancies. Using a two-week test-retest design, the questionnaire was completed by school students (n=173; 56% male, M=15.3± 1.53 years). The internal consistency and repeatability properties of each scale were assessed. Confirmatory factor analysis examined model-fit using multiple indices: Chi-square index, comparative fit index, goodness-of-fit index, and the root mean square error of approximation. The analysis was conducted in AMOS (16.0).

Results:

Reliability and factorial validity of each scale is supported: Internal consistency was adequate to strong ($\alpha = 0.52-0.80$); test-retest repeatability was adequate to excellent (ICC = 0.57 - 0.82); fit indices suggest each model to be adequate-

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to-exact fit for the data; factor loadings for each following model, that is, self-efficacy 0.54-0.73, situation 0.11-0.63, family 0.66-0.75 and friends 0.37-0.64 support, behavioral strategies 0.55-0.82, outcome expectations 0.37-0.81 and expectancies 0.43-1.98.

Conclusions:

The findings support the reliability and factorial validity of social cognitive scales relating to Brazilian adolescents' physical activity. The scales may have utility for examining mediators of dietary behavior change and validity testing of theoretical models based on Social Cognitive Theory.

P433

Physical activity trajectories over the teenage years among girls: National Growth and Health Study

Authors:

Soyang Kwon, Jungwha Lee, Mercedes Carnethon

Purpose:

To determine the developmental trajectories of physical activity (PA) over the teenage years among US girls using latent class growth analysis.

Methods:

We conducted secondary analysis using the National Growth and Health Study (NGHS), a longitudinal study of adolescent girls aged 9 or 10 years at baseline who were followed for 9 years. Self-reported leisure-time PA data (MET-times/week) was collected seven times at age 10, 12, 14, 16, 17, 18, and 19 years. Girls who had PA data at least three time points were included for data analysis (n=2,277; 51% Blacks and 49% Whites). Latent class growth analysis assigned latent class (subpopulation) membership to each girl based on posterior probability of membership of girls. Multivariable logistic regression analysis was conducted to examine the association between PA latent classes and demographics (race, parental education, and household income).

Results:

Latent class growth analysis identified three latent classes with distinct developmental trajectories of PA: 1) maintaining high PA level (desirable pattern: 6.2%), 2) moderately decreasing PA (37.6%), and 3) becoming inactive (inactive pattern: 56.2%). White girls (OR=7.7; 95% CI=4.2, 14.0) and girls whose parents' had a college education or higher (OR=5.1; 95% CI=2.4, 10.8) were more likely to follow the desirable pattern as compared with the inactive pattern.

Conclusions:

Three distinct PA trajectories over the teenage years among girls were identified. A small proportion of girls followed a desirable activity pattern. Interventions should be tailored to those girls whose socio-demographic characteristics make them less likely to fall in that group.

P434

Obesity, physical activity, and perceived athletic competence of low-income, urban minority girls: The relevance of friendship networks

Authors:

Kimberly Burdette, Amy Bohnert, Zareen Kamal, Lara Dugas, Amanda Ward, David Shoham

Purpose:

Obesity spreads through social ties, but little is known about the relevance of friendships to obesity and obesity-related behaviors and attitudes of minority girls, who are at high-risk for obesity. Girls experience a dramatic decline in physical activity during adolescence, and social bonding is a key reason girls participate in sports. The aim of this study is to examine how friendship networks relate to obesity, physical activity, and perceived athletic competence (PAC) among low-income, urban, ethnic minority girls.

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Methods:

Participants were 10-14 year-old low-income minority girls (N=57) enrolled in a four-week community-based summer program. Methods included accelerometers; questionnaires assessing physical activity, PAC, and friendship networks within the program; and anthropometric measurements used to calculate standardized BMI using CDC national norms for age.

Results:

Girls with higher zBMIs tended to have friends with higher zBMIs ($r=.30$, $p=.025$). Girls whose friends reported engaging in more vigorous physical activity were more likely to report engaging in vigorous physical activity themselves ($r=.47$, $p<.001$). However, accelerometer data was not related among friends. A girl's PAC was also not related to her friends' PAC, but a girl's PAC was positively associated with her friends' MVPA bouts as measured by accelerometers ($r=.28$, $p=.036$) and self-report of vigorous ($r=.28$, $p=.036$), moderate ($r=.28$, $p=.04$), and strengthening activity ($r=.32$, $p=.016$).

Conclusions:

The obesity and physical activity of friends may be an important factor in girls' athletic confidence, physical activity, and obesity risk and represents a promising future direction for effective and engaging obesity intervention strategies with minority girls.

P435

Predictors of moderate to vigorous physical activity among Chinese adolescent girls during school recess: A social ecological perspective

Authors:

Li Sun, Amy S Ha, Johan Y Y Ng

Purpose:

School recess is a crucial time segment for moderate to vigorous physical activity (MVPA) among adolescent girls. Few studies have employed social ecological model (SEM) to investigate predictors of MVPA during recess among adolescent girls in a Chinese community. The purpose of this study was to examine girls' PA levels during recess and, to identify predictors of MVPA among Chinese adolescent girls in Hong Kong based on SEM.

Methods:

A cross-sectional design was used. There were five hundred and four girls ($\text{Mage} = 13.49 \pm 1.11$) recruited from four secondary schools in Hong Kong. Girls' MVPA during recess were measured by accelerometers on five consecutive weekdays and filtered according to schedule provided by PE teachers. Participants' individual (self-efficacy, enjoyment for PA, perceived barriers), social environment (peer support, physical education teachers' support), physical environmental (perceived availability of PA equipment) factors were self-reported using the questionnaire. Multiple linear regression was employed to analyze the data.

Results:

Adolescent girls engaged in MVPA during recess about 0.71($SD=0.78$) minutes per day. Among the investigated factors, perceived barriers ($\beta=.18$, $p<.05$), peer support ($\beta=.15$, $p<.05$), and perceived the provision of PA equipment ($\beta=.15$, $p<.05$) were found to be significant predictors of MVPA. The model accounted for 10.9% variance to girls MVPA during recess.

Conclusions:

The results provided evidence for the assumption of SEM, adolescent girls' individual (perceived barriers), social environment (peer support), physical environment (perceived availability of PA equipment) should be considered in intervention for promoting their MVPA during school recess in Hong Kong.

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P436

Association of motivation to eat fruits and vegetables, garden, and cook on adiposity and metabolic outcomes in low-income Latino youth

Authors:

Lisa Watkins, Lauren Cook, Nicole Gatto, Samantha Miller, Grace Shearrer, Donna Spruijt-Metz, Jaimie Davis

Purpose:

Fruit and vegetable (FV) consumption is a critical factor in combating childhood obesity. F&V consumption might be related to autonomous (AM) or controlled motivation (CM); AM is doing something with volition, while CM is doing something because of pressure or demands. The aim of this study is to examine the relationship between AM and CM to garden (AMG, CMG), cook (AMC, CMC), and eat FV (AMFV, CMFV) on obesity and metabolic parameters in low-income Latino children.

Methods:

This cross-sectional study included 375 children (8.5 ± 0.5 y), 80% Hispanic and 53% female from baseline data of the LA Sprouts gardening program. The following measures were obtained: Height, weight, BMI, waist circumference, and body fat % via Tanita bioelectrical impedance. ANCOVAs assessed differences in AMFV, CMFV, AMG, CMG, AMC, and CMC (each separately) with adiposity and metabolic outcomes. A priori covariates included: age, sex, BMI percentiles, grade level, and ethnicity.

Results:

Compared to participants with low AMFV and low AMG, those with high AMFV and high AMG had 4% and 5% lower body fat percentages ($p=0.02$ and $p=0.01$, respectively). Compared to participants with low AMFV, those with high AMFV have 3% smaller waist circumferences. Compared to participants with low CMG and CMC, those with high CMG and CMC had 8% and 6% lower body fat percentages ($p \leq 0.01$ and $p=0.01$, respectively).

Conclusions:

These results suggest strong relationships between motivation to eat FV, garden, and cook and more favorable body composition. Future interventions should focus on fostering motivation to eat FV, garden, and cook.

P437

Eating behaviors and their relationship with adiposity in a sample of obese adolescents

Authors:

Silvia Costa, Lee D Hudson, Irwin Nazareth, Sanjay Kinra, Tim J Cole, Deborah Christie, Russell M Viner, HELP Trial Study Group

Purpose:

To describe the eating behaviors of obese adolescents, and investigate whether such behaviors are associated with measures of adiposity.

Methods:

We used baseline data from a community sample of obese adolescents ($\text{BMI} \geq 95\text{th}$ centile of UK1990 reference; age: 12-19 years; London, UK) recruited for the Healthy Eating Lifestyle Programme, a randomized controlled trial of a lifestyle intervention. Of the 174 participants, 171 (108 girls) had complete data on waist circumference, fat mass index (FMI, measured by 4-limb bioimpedance), body mass index (BMI) and reported frequency of sitting at table for dinner, 5/day fruit and vegetables (F&V), eating breakfast, and skipping meals other than breakfast. Chi-square tests were used to compare eating behaviors between sexes, and linear regression to assess associations between eating behaviors and adiposity indicators (adjusted for sex and age).

Results:

Mean BMI was 32.3 kg/m^2 ($\text{SD}=4.4$), BMI z-score 2.8 ($\text{SD}=0.6$), FMI 13.5 kg/m^2 ($\text{SD}=3.9$) and waist circumference 99.8 cm ($\text{SD}=11.1$). Most adolescents reported regularly (everyday or few times/week) sitting at a table for dinner (66%), breakfast (71%) and eating 5/day F&V (63%). 48% reported never/hardly ever skipping meals, with 38% regularly skipping meals. All behaviors were similar between sexes (all $p > 0.17$). Adolescents reporting never/hardly ever eating breakfast

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had significantly higher BMI ($B=2.41$; 95% confidence interval $[CI]=0.78-4.05$; $p=0.004$), BMI z-score ($B=0.33$; 95% $CI=0.13-0.54$; $p=0.002$), and FMI ($B=1.43$; 95% $CI=0.02-2.84$; $p=0.047$) than those regularly eating breakfast. No other associations were found.

Conclusions:

In this obese group, higher BMI/FMI was associated with never/hardly ever eating breakfast, indicating the latter as a potential intervention target to reduce adolescent obesity.

P439

Peer support and exercise motivation on an adolescent obesity treatment - exploring its effects on weight related quality of life

Authors:

António M. Quaresma, António L. Palmeira, Sandra Martins, Liliana Falcato, Helena Fonseca

Purpose:

To explore the effects of peer support and exercise behavior regulations of the first 6-months of the “Tratamento da Obesidade Pediátrica” (TOP) program on the weight-related quality of life (WRQoL). This is a preliminary analysis of the program designed to study the impact of the presence of peers on treatment outcomes.

Methods:

Fifty seven obese adolescents (38 girls) participated voluntarily in a 12 month multi-disciplinary treatment. The experimental group gathered participants that had one peer of their choice involved in the activities (the comparison group participated alone). Data from the first 6 months collected WRQoL (IWQoL-kids), exercise behavior regulations (BREQ-2) and peer support (adapted POPS), of the 41 participants that attended at least to 50% of the program sessions. Serial mediation analyses were conducted; group has the independent variable, peer support and exercise behavior has mediators, and WRQoL has dependent variable.

Results:

In the experimental group, friend involvement exerted a negative indirect effect on total WRQoL ($-.854$ to $-.023$) and on the WRQoL's body esteem dimension ($-.767$ to $-.007$). On the other hand, friend involvement in serial with intrinsic motivation exerted a positive indirect effect on WRQoL ($.001$ to $.455$) and body esteem ($.002$ to $.503$).

Conclusions:

Peer support showed mixed findings. It seems that it exerts a negative influence when considering its isolated effect on WRQoL, while it seems to affect positively WRQoL when in serial mediation with intrinsic motivation. These results should take into account the limited study power, given the preliminary data available.

Policy Physical Activity & Nutrition

P440

The effects of a sugar-sweetened beverage tax, information about the tax, and the combination of both on purchases in the New Zealand Virtual Supermarket

Authors:

Anja Mizdrak, Wilma Waterlander, Cliona Ni Mhurchu, Peter Scarborough

Purpose:

This pilot RCT is the first to experimentally investigate the impact of information provision on consumer responses to a commonly advocated 20% sugar-sweetened beverage tax (SSBT) using a virtual supermarket environment.

Methods:

Adults who identified themselves as main household shoppers were recruited from the general population of New Zealand, primarily Auckland. Participants completed a typical household weekly shop using the New Zealand Virtual Supermarket (computer-based simulation of an actual supermarket). Participants were randomised to either: Control,

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20% SSBT and information about the tax, 20% SSBT and no information, no SSBT and (deceptive) information. The information was a newspaper-style article informing participants that a 20% SSBT had been applied and the rationale for SSBT at a population level. The primary outcome was differences in sugar-sweetened beverage purchases. Purchases in other product categories, participants' awareness of and self-reported responses to price changes were recorded as secondary outcome measures.

Results:

Sixty participants were recruited (80% female, mean age 48 (SD 13.8) years, 76% of participants were New Zealand European, 5% Maori and 20% were from other ethnic backgrounds). The effects of the conditions on SSB purchases and other outcomes will be presented at the conference.

Conclusions:

To date, studies exploring the effects of SSBTs have not taken into account the effects of communicating the tax to consumers. It is vital to explore the magnitude and direction of this effect to inform effective policy making. The results of this study will inform discussions in this area.

P441

Researchers and advocates teaming up on childcare policy

Author:

Lorrene Ritchie

Purpose:

The California Healthy Beverages in Childcare law, implemented in January 2012, was designed to improve beverages served in all licensed childcare sites in the state. Collaboration between advocates and researchers was instrumental in the development of this policy. The purpose of this presentation is to describe the history of this unique partnership - how it was formed, what it has achieved, and lessons learned that others might apply in their work.

Methods:

The collaboration began with advocates asking about the status of nutrition in childcare and then helping researchers to design studies to answer these questions. Studies used similar methods to integrate research and practice: 1) State-wide survey of childcare providers; 2) key informant interviews to inform interpretation of survey findings; 3) policy convening to get recommendations and buy-in on policy next steps.

Results:

Benefits from the collaboration include: Identification of practice-based and policy-relevant issues where there were gaps in the research; building the evidence-base with rigorous and credible data to inform practice needs and future policy efforts; interpretation of findings in meaningful practice and policy-oriented ways; expansion of practice-based collaborators and policy supporter; dissemination of policy briefs to a wide audience; cross-fertilization of ideas across research and advocacy disciplines.

Conclusions:

A positive impact on both research knowledge and policy development resulted from researcher and advocate collaboration, such that the most meaningful questions were asked and answered using appropriate methodology and findings were used to inform policy as well as generate additional research questions and identify additional practice needs.

P443

Nutrient profiling systems: The case for national harmonization

Authors:

Dana Olstad, Kelly Poirier, PJ Naylor, Cindy Shearer, Sara Kirk

Purpose:

Nutrient profiling systems are increasingly being applied to determine which foods should be made available to children. Selection and operationalization of nutrient profiling systems is therefore a critical task, as their standards may

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influence children's dietary intake, body weight and health outcomes. This study assessed agreement among nutrient profiling systems used in three Canadian provinces and compared the average nutritional profile of vending machine items in facilities that were (implementers) and were not (non-implementers) adhering to voluntary provincial nutrition guidelines.

Methods:

The government-issued nutrition standards for foods/beverages offered in community settings in British Columbia (BC), Alberta (AB) and Nova Scotia (NS) were compared. One snack and one beverage vending machine within 18 community facilities (3 implementers and 3 non-implementers per province) in BC, AB and NS were audited, along with 2 milk machines in AB (n=38 machines). Two individuals rated each item (n=1184) using BC, AB and NS nutrition standards. A third individual re-rated items where there was disagreement. Cohen's Kappa statistic assessed agreement among rating systems.

Results:

Overall agreement among rating systems was moderate, with kappas ranging from 0.49-0.66. Agreement among beverages (0.53-0.81) exceeded agreement among snacks (0.33-0.56). Implementers offered healthier products than non-implementers ($p < 0.05$).

Conclusions:

The food industry is unlikely to reformulate products to meet distinct provincial nutritional standards, and thus the observed differences among nutrient profiling models may discourage product reformulation. Harmonization of nutrient profiling systems at a national level may be an efficient means to encourage product reformulation by industry and improve children's food environments.

P444

Public support government decisions on foods provided in school canteens is increasing, Western Australia 1995 to 2012

Authors:

Christina Pollard, Rosie Meng, Janette Lewis

Purpose:

To investigate the level of community support for factors related to food policy options to improve diet, reduce overweight and obesity among Western Australian children through school canteens. Meals bought from home and school tuck shops supply Australian children's school lunches.

Methods:

Pooled data from six telephone Nutrition Monitoring Surveys of 7,044 adults aged 18-64 years were collected between 1995 and 2012. Views on who should choose the foods sold in school canteens were examined along with attitudes regarding the restriction of sales of high fat foods. Descriptive and logistic regression analyses were conducted using survey module of STATA 12. The Health Department granted ethics approval.

Results:

Across all surveys most respondents identified parents as those who should decide the type of food sold at school canteens (58%). Since 2004 more respondents chose the Health and Education Departments as who should choose the food sold. Across all years, there was strong agreement for restricting the sale of high fat foods, 86.1% in 2012. In 2004 and 2009 respondents were 31% to 41% ($p < .05$) more likely to have increased their agreement with fatty food restrictions compared to 1995.

Conclusions:

Public support for government reductions in the sale and promotion of unhealthy foods through school canteens is increasing and corresponding to the Education Department mandating nutrition policy through all Western Australian public schools restricting the sale of unhealthy food and drink. Positive changes in public opinion are crucial for ongoing commitment to mandated policies to prevent overweight among children.

Older Adults Physical Activity

P445

Physical activity, eating 'well' and health in the retirement transition: Narratives on action and belief

Authors:

Ben Heaven, Nicola Hobbs, Jose Lara, John Mathers, Martin White, Suzanne Moffatt

Purpose:

Retirement presents an opportunity to intervene to improve outcomes in later life, as individuals adjust wellbeing associated behaviors. However, in the context of diverse retirement trajectories, identifying how to intervene effectively is a challenge. Our objectives were to understand: (1) Experiences of health and health behavior; (2) rationale for behavior; and (3) implications for intervention development in the context of retirement transition.

Methods:

Qualitative study involving 48 men and women aged 53-77 recruited from manual and non-manual social classes in urban and rural areas in England. Data were collected iteratively through focus groups (n=6) and interviews (n=17) using constant comparative methods. Inductive analysis was also informed using Sen's (1985) capabilities approach and elements of Self-Regulation Theory (SRT).

Results:

Individuals experienced disruption to lifestyle behaviors through retirement and perceived this transition as a challenge to identity. Physical activity (PA) and dietary behavior may change in response to new (often unanticipated) lifestyle opportunities and constraints, and as individuals attempt to maintain a coherent and 'acceptable' sense-of-self. Some public health messages regarding behavior change were regarded with scepticism, and questioned in narratives privileging the role of 'fate' in health outcomes. Disruption through retirement was linked in narratives to uncertainty in personal objectives, and the means of obtaining them.

Conclusions:

Attempts to maintain 'coherence' in retirement share parallels with 'control' in SRT. Interventions that assist individuals to mobilise resources to achieve personalised outcomes (capability), may be effective in changing PA and eating behavior through a positive shift toward a 'capable' and 'active self'.

P446

A mixed-method approach to identifying intervention-related markers of long-term physical activity maintenance in older adults

Authors:

Theresa Floegel, Peter Giacobbi, Joseph Dzierzewski, Adrienne Aiken Morgan, Beverly Roberts, Michael Marsiske, Christina McCrae, Matthew Buman

Purpose:

Little is known about how short-term behavioral interventions (≤ 6 months) can be delivered to enhance long-term maintenance (≥ 12 months) of physical activity in older adults. We delivered goal setting, social support, and mental imagery intervention components in a 4-month social-cognitive and self-determination theory-based physical activity randomized controlled trial. The purpose of this analysis was to prospectively identify intervention components that may promote long-term maintenance of physical activity.

Methods:

Participants (N=24; aged 63.5 ± 8.3 years) were interviewed about their perceptions of these intervention components at the end of the intervention (4 months) and physical activity was assessed at 18 months follow-up via self-report. Maintainers were defined as participants meeting US national physical activity guidelines at 18 months. Mixed-methods analyses using a pragmatic content analysis of interview data were conducted.

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Results:

Data from maintainers (25%, n=6) and non-maintainers (75%, n=18) elicited 290 unique coded elements. Maintainers cited more specific goals (e.g., “my goal was 12000 steps every day”) or actions to achieve goals (e.g., “reviewed my [goal] card every day”) related to physical activity than non-maintainers (66% vs. 27%). Maintainers cited more social support from family/friends (e.g., “my granddaughter takes me walking”) than non-maintainers (66% vs. 22%). There was no difference between maintainers and non-maintainers in reports of mental imagery.

Conclusions:

Specific goal setting behaviors and social support from family/friends may be key elements of physical activity maintenance in older adults. Future intervention studies should encourage these behavioral components to support the attainment and maintenance of physical activity.

P447

Designing a health promotion program for retirement villages - Retirement Village Physical Activity and Nutrition for Seniors project (RVPANS)

Authors:

Annie Holt, Jonine Jancey, Andy Lee, Deborah Kerr, Suzanne Robinson, Peter Howat

Purpose:

The Retirement Village (RV) is a unique setting to access and engage a middle aged and older population group to improve their health behaviors. However, RV residents often do not engage in the health programs when they are offered. This study aimed to identify: Enablers/barriers to being physically active (PA) and maintaining a healthy diet, as well as preferred intervention strategies in this setting.

Methods:

Five focus groups (n=40) were conducted with purposely recruited RV residents aged (60-75) comprised of males (n=10) and females (n=30) from RV's that differed in size, style and geographical location. Focus groups were conducted using a questionnaire that assessed barriers/enablers to participation and strategies to implementation. Verbatim transcriptions of focus groups and interviews were analysed using a thematic analysis approach. Quantitative analysis included frequency of PA by type and minutes/week (n=40).

Results:

Barriers/enablers to engaging in regular PA included access to fitness facilities and programs, lack of organisational support by RV management (costs involved in providing dedicated staff) and an apathy/unwillingness to participate in programs offered. Barriers/enablers to nutrition behaviors included already ‘knowing what to eat’, living ‘alone’; while health concerns acted as a motivator for dietary changes. Preferred interventions strategies included a regular walking program (2-3 time/week) and easy to use program resources (information booklet, exercise charts, newsletters) and supportive program facilitators who would be available to support participants for the duration of the project.

Conclusions:

This research has informed the development of a home-based PA and nutrition program currently being implemented in Perth, Australia.

P448

Macy - The Health Literacy intervention for elderly and young people - First results: Nutrition and physical activity

Authors:

Katharina Metzner, Annekatrin Bütterich, Anne Beyen, Janina Klein, Marina Kollmann, Michael Klein, Holger Hassel

Purpose:

Macy was developed to encourage Health Literacy of elderly, aged ≥ 60 and children between 11 and 14 years. The study aimed to improve, among others, physical activity and nutrition, focused on fruits, vegetables and beverages.

Methods:

The intervention included 22 modules (nutrition: 8; physical activity: 4). In total 8 generation-spanning groups took part. 87 elderly and 91 children participated at the beginning (32% dropped out). The study comprised a baseline (t0) and two follow-ups (t1; t2). The current results were based on a T0-T1 comparison. The data was analyzed in SPSS with t-tests and Wilcoxon-tests.

Results:

The consumption of fruits significantly rose from 1 to 2 servings in both target groups, but the consumption of vegetables did not increase. The elderly increased their number of beverages from 6 to 8 glasses. They also enhanced their physical activity with only a mainly light perceived exertion level. Both target groups enjoyed the intervention (elderly 96,6%; children 88,5%). Further results will also refer to social participation and body acceptance.

Conclusions:

The improvement of physical activity as well as the increased beverage consumption might be biased by a seasonal effect. More physical exercises are necessary to reach physical activity with a high exertion level. A reason to explain the unaltered vegetable consumption could be that the intervention mainly focused on the preparation of fruits. Macy encourages Health Literacy and promotes active aging of the elderly. Therefore, the intervention will be introduced to further social services in Germany.

P449

Association of sedentary behavior, body mass index and cardiovascular fitness in Thai older adults

Authors:

Atchara Purakom, Kasem Nakornkhet

Purpose:

Physical inactivity has been proposed as important risk factors for cardiovascular disease (CVD), obesity in older adults. Therefore, this study aimed to investigate the association of sedentary behavior, BMI and cardiovascular fitness among Thai older adults.

Methods:

A cross sectional study was conducted at Nakornpathom, Thailand in 2013, including three hundred and eleven older adults subjects ranging from 60-85 years (mean age 68.4±6.4). Sedentary behavior were assessed with GPAQ2, weight and height were used to calculate BMI. Cardiovascular fitness were assessed for systolic and diastolic blood pressures, resting heart rate and 2 minute step in place test from senior fitness test (SFT) were measured. Multivariable logistic regression models were used for data analysis.

Results:

A significant positive association was observed between sedentary time (2-4 hours/day) and obesity after adjusting for confounders ($p < 0.05$). The odd ratio for spending sedentary time in obesity group higher than those normal weight group (OR = 2.05, 95% CI: 0.33-1.15). However, there were no significantly associations between sedentary time and cardiovascular fitness.

Conclusions:

The study suggested that the obesity older adults spending higher amounts of time in sedentary behaviors. Public health should reduce sitting and reclining time along with promoting MVPA in older adults. Future studies should investigate larger samples that represent the entire community and continue to account carefully for sedentary time and cardiovascular fitness. This work was supported by Thai Health Promotion foundation.

P450

Understanding intra-individual changes in physical activity and predictor variables during the retirement transition

Authors:

Suzanne McDonald, Nicola Hobbs, Martin White, Falko Sniehotta

Purpose:

Physical activity (PA) behavior changes considerably during the transition from employment to retirement. The trajectory of PA behavior change and the determinants thereof are likely to differ between individuals.

Methods:

A series of n-of-1 studies were conducted with 5 participants (2 male) aged 56-77 who were approaching retirement. PA, measured by tri-axial accelerometry, and ecological momentary assessment of sleep, mood, tiredness, time pressure, stress, pain, intention, perceived control and priority for engaging in PA were collected daily for a period of 4-6 months, which included time before and after the participant's retirement date. Additional idiosyncratic variables were included as potential predictors of daily PA. Data for each participant were analysed using interrupted time series analysis.

Results:

PA trajectories over the retirement transition differed considerably between participants. The individual patterns of psychological predictors of daily PA differed in all participants. In addition, differences in prediction patterns before and after retirement were investigated and within-individual variability in predictor patterns pre and post retirement was found.

Conclusions:

The direction and degree of PA change during the retirement transition varies considerably between individuals. N-of-1 methods can further understanding about individual patterns of behaviour and test theories of individual behaviour. This method also identifies predictors of behaviour that are unique to the individual and this has the potential to inform highly tailored intervention approaches.

P451

Feasibility of increasing the length and number of standing breaks in older adults: Results of a pilot study

Authors:

Jacqueline Kerr, Jordan Carlson, Michelle Black, Gina Merchant, Katie Crist, Khalisa Bo, Andrew Atkin, Simon Marshall

Purpose:

To assess the feasibility of an intervention to increase the number of sit to stand transitions in older adults. Previous sedentary behavior interventions have increased standing time but have not succeeded in increasing sit to stand transitions. Such transitions may be easier for older adults to achieve than longer standing bouts and may have specific effects on biomarkers of aging.

Methods:

Thirty older adults (aged 50-70) were randomized to a two-week "reduce sitting time" or "increase sit to stand transition" group and received tailored written materials. Multiple tools were provided to support self-monitoring of standing and sitting including electronic reminders, standing desks, and timers. Participants also wore a thigh mounted ActivPal during the entire intervention and received weekly feedback based on the data. Changes from baseline (7 days pre-intervention) to follow-up (final 7 days of intervention) in average daily standing breaks were compared across conditions using repeated measures analyses of variance.

Results:

Across the groups, baseline sit to stand transition were 43.8 (SD 14.3) per day. Participants in the sit to stand transition group increased their daily average number of standing breaks by 7.0 (SD=6.4), whereas those in the reduced sitting group had 3.6 (SD=3.6) fewer average daily standing breaks ($p<.05$ for group*time effect).

Conclusions:

It is possible to objectively measure and increase sit to stand transitions in older adults when a clear goal and appropriate tools and reminders to support self-monitoring are provided. Further analyses will test the effect of increased standing breaks on total sitting time.

P452

Effects of multi-component program on physical activity level and functional fitness in rural elderly

Authors:

Atchara Purakom, Mayuree Tanomsuk, Supornpip Pupanee, Kasem Nakornkhet

Purpose:

Physical activities and sedentary living perform a major role to maintain physical independence in daily living and has been identified as an important public health priority. The multi-component program is considered to be an appropriate program for the elderly with physical fragility. The aim of this study is to examine the effects of a multi-component program on physical activity level and functional fitness in rural elderly.

Methods:

Participants living in the rural communities of Thailand total 45 (69.9±5.4 year). An eight-week multi-component aerobic, resistance training, strength and flexibility exercise program as well as home based exercise, and health education were implemented. Functional fitness were evaluated using the Senior Fitness Test and physical activity level was assessed with GPAQ2 at baseline and again 8 weeks later.

Results:

After 8 weeks, significant improvements were observed for the development of MVPA, and functional fitness in terms of muscular strength and flexibility in the intervention groups from baseline to the end of the intervention ($p < .05$). Meanwhile, sedentary time decreased gradually in the intervention group after 8 week ($p < .05$).

Conclusions:

These results highlight the potential of a multi-component program to promote physical activity in rural elderly to gain a more independent, active lifestyle and reduce their sedentary time. It improved functional fitness and performance of daily functioning tasks. However, the finding suggested that a recreational program should be included in the future intervention. This work was supported by Thai Health Promotion foundation (55-0169).

P453

Why few older adults participate in complex motor skills and the potential for increasing participation

Authors:

Katarina Kraft, Kylie Steel, Rebecca Olson, Dafna Merom

Purpose:

Neuromotor fitness can reduce falls in older persons at risk for falling and improve or maintain physical and cognitive function. Complex motor skills (CMS) are involved in many physical activities (e.g., ball games, dance), which can improve neuromotor fitness. This study aimed to understand why few older adults participate in CMS.

Methods:

This qualitative study utilized semi-structured focus groups with older adults living independently in retirement villages and in the community in Sydney, Australia. Focus on perceived difficulty and challenge in activities served as a reference point. Verbatim transcriptions were coded inductively to discover categories and concepts grounded in the participants' views. NVIVO v10 qualitative software was used for data management.

Results:

Six focus groups with 36 older adults participated in the study (mean age=76; 31% male). Perceived difficulty of 10 physical activity types currently undertaken by older adults in Australia were evaluated, mostly in reference to the activity's physical effort in relation to aerobic workload. Challenge in performing activities, was attributed to skill level,

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change in environment conditions during engagement, cognitive aspects and personal physical abilities. Concepts that appeared to increase likelihood of participation in CMS were age appropriate modification, enjoyment, social aspects, past experience, cost, accessibility and having experienced instructors.

Conclusions:

This qualitative study offers recommendations, based on inductive findings, for increasing participation in CMS. Modifying activity to suit age and increasing exposure during the life course may help maintain participation to old age. Enjoyment and social elements of CMS are the most important enablers to older adults.

P454

Activity monitor-based health intervention increases fitness in older adults: A pre-experimental pilot study

Authors:

Zakkoyya Lewis, Elizabeth Lyons

Purpose:

Insufficient physical activity is an increasing concern as adults age. Electronic activity monitors paired with tablet devices can effectively monitor and provide feedback to increase physical activity. However, it is widely believed that older adults are resistant to technology. There is a need to investigate feasibility and acceptability of monitor-based interventions in this population.

Methods:

10 sedentary overweight adults aged 55-79 were recruited to take part in this pre-experimental 6-week clinical trial. Fitness and physical activity were assessed by 6-minute walk test and SenseWear armbands. Exercise related goal setting and planning were assessed through validated self-report measures. Acceptability was also measured through self-report. The intervention provided a Jawbone Up monitor and iPad mini tablet as well as weekly brief counseling. Paired sample T-Tests were performed for quantitative analysis.

Results:

Participants wore the monitor for an average of 6.73 days per week over the 6 weeks. Fitness significantly improved (-50.57 ± 15.83 feet, $p=0.011$), but moderate intensity physical activity showed no change (5 ± 6.86 minutes per week, $p=0.487$). Significant improvements were found for exercise-related goal setting ($p=0.014$) and planning ($p=0.005$). Acceptability feedback showed that the intervention was easy, simple and participants would continue to follow given recommendations.

Conclusions:

The results of this preliminary study suggest that technology can be used to increase fitness in older adults. Technology-based intervention using mobile devices is feasible and acceptable to this group. The monitoring nature of this technology may also improve goal setting and planning.

P455

Reducing sitting time in older adults with obesity

Authors:

Dori Rosenberg, Nancy Gell, Mikael-Anne Greenwood-Hickman, Anne Renz, David Arterburn

Purpose:

Obese older adults are at increased risk for inactivity and chronic conditions. Interventions to reduce sitting time (ST) have not specifically targeted this population. We tested the feasibility and acceptability of ST reduction in adults ages 60+ with a BMI >30 kg/m².

Methods:

We completed a mixed-methods 8-week pre-post test pilot study (N = 16, mean age = 70, mean BMI = 35.2, 75% female; mean baseline ST = 8.88 hours/day). The social cognitive theory based intervention consisted of 5 health coaching calls (goal-setting around reducing total ST and increasing sit-to-stand transitions [SST], self-efficacy, self-monitoring) and

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feedback from ActivPAL inclinometers. Paired t-tests examined change in ActivPAL ST and SST. Thematic analysis was conducted for transcribed in-depth qualitative exit-interview data.

Results:

Among 14 participants with ActivPAL data, 1 did not improve either ST or SST; 3 improved SST only; 4 reduced ST only; and 6 improved both SST and ST. ST decreased by 31.2 minutes ($p = .10$) or 3.7% adjusting for wear time ($p = .12$); among those with improved ST, ST decreased by 54 minutes ($p = .02$) or 6% adjusting for wear time ($N = 10$; $p = .04$). SST increased by 1.8 ($p = .33$) and 5.2 among those with any improvement ($N = 9$; $p = .013$). Interview themes suggested individual, social, and environmental factors are important for changing ST. Participants reported improved activity, alertness, sleep, and stiffness.

Conclusions:

It was feasible and acceptable to reduce ST and increase SST in older adults with obesity.

P456

Exploring relationships between physical activity and mental health in three older adult populations

Authors:

Rachel Millstein, Jacqueline Kerr, Katie Crist, Lu Wang, Dori Rosenberg

Purpose:

Little research compares physical and emotional functioning in different aging settings. We examined associations between several indicators of mental health (MH) and physical activity (PA) among older adults in three settings: Retirement communities (RCs), senior centers (SCs), and unaffiliated with a SC or RC.

Methods:

Seniors in RCs ($n=236$), SCs ($n=81$), and unaffiliated ($n=40$) completed validated surveys to assess MH (stress, quality of life, depressive symptoms) and wore accelerometers for 7 days. Moderate-vigorous (MVPA) and high-light PA (HPLA) were calculated using established cut-offs: 1952 and 1041 counts, respectively. Separate linear regression models were conducted for each site and MH outcome, including MPVA, HPLA, and covariates.

Results:

Participants (ages 56-102, 46.9-93.2% white, 40-69.5% female) ranged in mean MVPA minutes/day: 10.32 (RCs)-18.16 (SCs) and HPLA minutes/day: 20.43 (RCs)-23.92 (SCs). Depressive symptoms and stress were highest among unaffiliated seniors and lowest among those in RCs. QOL was positively associated with MVPA across all settings (RCs Std. $B=.22$, 95% CI=.01-.02; SCs Std. $B=.39$, 95% CI=.01-.02; unaffiliated Std. $B=.63$, 95% CI=.00-.01). Depressive symptoms were inversely associated with MVPA in RCs and SCs (Std. $Bs=-.31$, $-.42$, 95% CIs=-.13- $-.04$, $-.16$ - $-.01$, respectively). Stress was inversely associated with MVPA in RCs (Std $B=-.23$, 95%CI=-.07- $-.01$). HPLA and depressive symptoms and stress showed inverse associations in RCs.

Conclusions:

Across settings, PA and MH showed relationships in expected directions. The relationships differed by setting, with QOL showing the strongest associations with MVPA across settings. Larger samples of various communities of seniors would help to further clarify these relationships.

P457

Objective measurements of free-living sleep and activity patterns in older Icelandic men and women

Authors:

Robert Brychta, Nanna Arnardottir, Erlingur Johannsson, Gudny Eiriksdottir, Annemarie Koster, Paolo Caserotti, Thorarinn Sveinsson, Kong Chen

Purpose:

To identify cross-sectional and seasonal sleeping and physical activity (PA) patterns in a community-dwelling Icelandic healthy aging population using accelerometers.

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Methods:

Participants (n=244, male/female 110/134, age 79.7±4.9 years, BMI 26.9±4.8 kg/m²) wore an Actiwatch Spectrum on the non-dominant wrist to assess sleep and an Actigraph GT3X on the right hip to assess PA for at least 4 days over a week of free living. A subpopulation (n=72) repeated the 7-day measurement during seasonal periods with greater (13.4±1.4 hours) and lesser (7.7±1.8 hours) daylight.

Results:

Compared to women, men had a shorter sleep duration (462±80 vs. 487±68 minutes, p=0.008) mainly due to an earlier rise time, and a higher number of awakenings per night (46.5±18.3 vs. 40.2±15.7, p=0.007). No gender differences were observed in sleep efficiency (80.9±10.1% vs. 82.2±9.8%) or latency (34.4±28.7 vs. 39.3±33.6 minutes). Men and women had similar average daily PA (134±70 and 127±62 total counts/wear-time minute, respectively) but women were less sedentary (613±83 vs. 641±88 wear-time minutes, p=0.01) and had more light activity (181±56 vs. 158±55 minutes, p=0.001). In the subpopulation with two visits (n=72), the 5.7±2.6 hour difference in daylight had little impact on the within-individual differences in sleep patterns and PA for both men and women and differences in daylight hours were uncorrelated to differences in wear-time counts, sleep duration, and sleep efficiency.

Conclusions:

The sleep and PA characteristics of this unique population revealed some gender differences, but the lack of variation in response to significant daylight changes may be due to long-term adaptation.

P460

Evaluation of macronutrients intake against 'Dietary Reference Intake (DRI)' for older Chinese people: A preliminary analysis of data from the China Health and Nutrition Survey (CHNS)

Authors:

Xiaoyue Xu, Julie Byles, John Hall

Purpose:

Research on the nutritional status of older Chinese is very limited. This study aims to describe macronutrients intake and determine whether older Chinese (aged ≥60) are meeting with diet recommended intake (DRI).

Methods:

In CHNS, dietary data of 2,746 older Chinese were obtained by interviews on 24 hours-recall basis in 2009. Macronutrients intake was calculated based on 'China Food Consumption Table'. ANOVAs and Linear regression models were used to explore the association between macronutrients intake with age groups, gender, urban vs rural areas and four Chinese regions. Chi-square was used to assess the association between different levels (below, meeting and above) of DRI for macronutrients intake by age groups, gender, urban vs rural areas and four Chinese regions.

Results:

Less than 1/3 of the 2,746 met the DRI for carbohydrate and fat-energy percentage. Less than 1/5 of the 2,746 met the DRI for protein-energy percentage. More than 1/2 of older people have a higher fat-energy percentage intake against the DRI. There are strong relationships between urban and rural areas (p<0.001) and gender (p<0.05) for all three macronutrients. There is no significant difference between Northeast and West China for carbohydrate and fat intake (p>0.05), and no significant difference between different age groups for fat intake (p=0.14).

Conclusions:

These results provide evidence of the macronutrients status of older Chinese. Different macronutrients intake across urban and rural areas in four regions suggests there are considerable variations in dietary behaviors and patterns. Diet-disease relationships will be explored further after identifying dietary patterns in the CHNS.

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Measures of diet quality are associated with physical and mental health status of older Australians: WELL study

Authors:

Catherine Milte, Maree Thorpe, David Crawford, Kylie Ball, Sarah McNaughton

Purpose:

To examine associations between diet quality measures and self-reported physical and mental health two years later in older men and women.

Methods:

Adults aged 55-65 years (n=1150 men and n=1307 women) completed a postal survey including a 111-item food frequency questionnaire at baseline and two years. Diet quality at baseline was assessed via the revised dietary guideline index (DGI), recommended food score (RFS) and Mediterranean diet score (MDS). The RAND 36-item health survey assessed self-reported health at two years across eight domains (physical function, role physical, role emotional, social function, emotional well-being, energy/fatigue, pain, general health). Associations between diet quality and health were assessed separately for men and women using logistic regression adjusted for age, education, smoking, physical activity, BMI and menopausal status in women. Odds ratio and 95% CI for the top quartile compared to lowest is reported.

Results:

In men, DGI was associated with better general health (1.56, 1.09-2.22), energy (1.80, 1.26-2.58) and physical function (1.45, 1.01-2.08). In women, associations between two measures of diet quality (DGI, RFS) and physical health domains were observed: Physical function (DGI: 1.65, 1.19-2.13; RFS: 1.68, 1.20-2.35), general health (DGI: 1.86, 1.34-2.57; RFS: 1.59, 1.14-2.21). Additional associations between diet quality and emotional well-being were observed in women only (DGI: 1.40, 1.02-1.93; RFS: 1.42, 1.03-1.96).

Conclusions:

Older adults with better quality diets report better physical health, with additional effects on mental health observed in women only. Further investigation will determine if diet can influence maintenance of health over time in an ageing population.

P462

Canadian Health Advanced by Nutrition and Graded Exercise (CHANGE): An effective and feasible approach to lifestyle intervention in primary care Canadian Health Advanced by Nutrition and Graded Exercise (CHANGE)

Authors:

Doug Klein, Khursheed Jeejeebhoy, Paula Brauer, Angelo Tremblay, Daren Heyland, Rupinder Dhaliwal, Caroline Rheame, Lew Pliamm

Purpose:

Metabolic syndrome (MetS) is the basis of heart disease, stroke, diabetes and major contributor to healthcare costs. MetS can be reversed by dietary manipulation and exercise. The purpose of the CHANGE program is to demonstrate a protocol of nutritional modification and graded exercise over a 12 month period delivered by a dietician, kinesiologist and family doctor team will reverse the metabolic syndrome.

Methods:

In this pilot project, patients were identified by their family physician as having the MetS. Initially, the family physicians enroll patients, complete baseline measurements and stabilize medications. Subsequently, the team creates a personalized diet and exercise plan based on the CHANGE protocol. The family physician, dietitian and kinesiologist will evaluate the patient's progress at regular intervals and make changes to the intervention throughout the project.

Results:

To date, 232 patients with MetS have been enrolled. The average age is 58.6 years (SD±9.7) with 52.6% of the participants being female. At all three sites, the protocol has been implemented without difficulty and staff have been successfully recruited and trained. Preliminary analysis shows a reversal of MetS in 11.8 % of the participants after 3

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months, 21% after 6 months and 25% after 9 months. Reversal of >1 MetS criteria was observed in 39.5%, 43.3%, 61.5% of patients at 3, 6 and 9 months respectively. Patients' attended 82 to 96% of the prescribed visits.

Conclusions:

The CHANGE project is demonstrating improvements in metabolic abnormalities, and appears to be a feasible approach to support lifestyle change among MetS patients.

P463

How does retirement community environment affect changes in step counts over time?

Authors:

Kevin Moran, Lu Wang, Suneeta Godbole, Loki Natarjan, Jordan Carlson, Jacqueline Kerr

Purpose:

To explore whether changes in objectively assessed physical activity (PA) are related to campus environmental factors among individuals living in retirement communities (RCs).

Methods:

Older adults (mean age = 83, SD = 6; 72.3% female) were recruited from 11 RCs. RCs were randomized to either an attention control condition, or a multi-level walking intervention. Step counts were measured at baseline and 3 months by the Actigraph accelerometer. RC PA environment was measured using "The Audit of Physical Activity Resources for Seniors" (APARS), providing nine scales to assess both inside and outside positive PA features. Separate linear mixed model analyses were performed to measure associations between each APARS scale and change in daily step counts, after adjusting for demographics and treatment condition. The interactions between APARS scores and treatment condition were also examined.

Results:

247 participants had a mean daily step count change of 507.76 ± 2864.37 . The three environmental features most predictive of an increase in step counts were: Accessibility of the main communal building ($p = .013$), inside exercise facilities ($p = .029$), and outside aesthetics ($p = .069$). APARS scale*condition interactions approached significance in these models (p -values ranging from .075 to .125). Intervention condition predicted an increased step count in all models (p -values from $< .001$ to .08).

Conclusions:

PA environment in RCs significantly predicts an increase in daily step counts in an elderly population. Additionally, a multilevel PA intervention succeeded in increasing step counts, independent of PA environment.

P464

Physical activity for mental wellbeing in older people

Authors:

Phil Mason, Ade Kearns

Purpose:

To determine whether higher levels of physical activity (PA) amongst older residents of deprived neighbourhoods are linked to better mental wellbeing.

Methods:

Cross-sectional study of a sample of 1450 British residents aged 60+ years from 33 high-poverty neighbourhoods in Glasgow, UK. A multilevel modelling approach was taken to investigate variation in the WEMWBS mental wellbeing score in relation to levels of PA (measured by the IPAQ), and a range of perceptions and objective measures of the residential and neighbourhood environment.

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Results:

The low PA group had an average WEMWBS score of 49.2. The medium and high PA groups had significantly higher scores (+0.8 and +1.9 points, respectively). Such differences are considered substantive for this scale. These differences were generally smaller than those that could be ascribed to other characteristics: Regular access to a vehicle (+1.8 points), home considered safe (+2.1), neighbourhood gives a sense of progress (+3.0), good quality neighbourhood environment (+1.6) and parks (+1.6), participation in groups (+3.0). On the other hand, neighbourhood-wide factors (crime rate, prevalence of high-rise flats, tenure mix) showed no apparent association with mental wellbeing.

Conclusions:

Doing more physical activity contributes to better positive mental wellbeing in older people, although they may not be as important as some psychosocial evaluations of the home and neighbourhood, the perceived quality of the local area, and social contacts. Nevertheless, PA interventions that promote better physical health in older people could also have benefits for mental wellbeing.

Adult Nutrition

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Package size and serving size of non-alcoholic beverages: A cross-sectional study across four high income countries

Authors:

Maartje Poelman, Helen Eyles, Elizabeth Dunford, Alyssa Schermel, Bruce Neal, Jacob Seidell, Ingrid Steenhuis, Cliona Ni Mhurchu

Purpose:

This study sought to assess the package size and serving size of non-alcoholic beverages available in Australia, Canada, the Netherlands and New Zealand.

Methods:

Cross-sectional surveys were undertaken in the two largest supermarkets of each country in 2013. Data on package size and manufacturer-recommended serving size were collected for six types of non-alcoholic beverages (soft-drinks; energy-drinks; sport-drinks; juices; fruit flavored & ice-tea drinks; and flavored waters). Differences in package size and serving size of individual pack size (IPS) drinks (n= 891) and bulk pack size (BPS) drinks (n=1907) within and between countries were determined.

Results:

For all IPS-drinks, the mean package size (M= 412mL; SD=157) was on average 53 mL more than the mean serving size (359mL; SD=159). The package size of IPS-drinks differed significantly between all countries (F=25.3;P<0.001). The mean serving size presented on BPS-drinks was 231 mL (SD=32) and was significantly different between all countries (F=118.7;P<0.001). Of all beverages included, 103 different serving sizes were displayed on IPS-drinks and 37 different serving sizes displayed on BPS-drinks. The most common serving size for IPS-drinks was 250mL in Australia, Canada and the Netherlands, and 500mL in New Zealand. For BPS-drinks, 250mL was the most common serving size in Australia, Canada and New Zealand, and 200mL in the Netherlands.

Conclusions:

There is substantial inconsistency in package size and recommended serving size of non-alcoholic beverages available in four high-income countries, especially for IPS-drinks. Unambiguous presentation of serving sizes is urgently needed to provide clear information to the consumer.

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Healthy meals and prevention of lifestyle diseases

Authors:

Ida Grini, Tor Erling Lea, Jan Thomas Rosnes, Bjørn Liaset, Grethe Iren Borge, Ida Rud, Bente Kirkhus

Purpose:

The aim of the study was to provide a better understanding of the role of meal composition on parameters associated with development of metabolic syndrome. The project focused on preserving health components (fibre, polyphenols, proteins, and unsaturated fat) of a healthy meal of salmon, broccoli and barley, and investigated effects on satiety, low-grade inflammation and gut microbiota.

Methods:

Health components in raw materials were measured before and after processing and storage. In vitro digestion- and fermentation models were used to study effects on lipid digestion and microbiota. Cell models were used to study bioactivity, and health effects of different meals were studied in a mouse model.

Results:

The results show that it is possible to obtain good nutrient retention, even after significant processing. Some processing methods can result in a loss of polyphenols, while others can provide increased release. In vitro digestion experiments showed that meal ingredients may influence the digestion of macromolecules, e.g. delay the digestion, which in turn may affect satiety. Broccoli and barley had different effects on fat digestion, including changes in lipase specificity, which may affect bioaccessibility of omega -3 fatty acids in salmon. In vitro fermentation experiments of the meal and its components stimulated bacteria associated with healthy normal-weight persons and increased production of beneficial short chain fatty acids.

Conclusions:

The health effects of the meal was shown in mice, with a quick change in microbiota and better health parameters when switching from a hamburger meal to the meal with salmon.

P467

Short en medium term evaluation of a web-based computer-tailored nutrition education intervention including cognitive and environmental feedback for adults: A randomized controlled trial

Authors:

Linda Springvloet, Lilian Lechner, Hein de Vries, Math Candel, Anke Oenema

Purpose:

To study the efficacy of a cognitive- and environmental-feedback version of a web-based computer-tailored nutrition education intervention on fruit, vegetable, high-energy snack and fat intake, among lower and high-educated adults.

Methods:

A RCT was conducted with a basic (cognitive-feedback; n=455), plus (additional environmental-feedback; n=461) and control (generic information; n=433) condition. Participants (N=1,349; mean age: 49.05; 35.4% men; 45.7% high-educated) completed online questionnaires at baseline (T0) and 1- (T1) and 4-months (T2) post-intervention. Linear mixed model analyses were performed to study differences in change over time between conditions among participants who do not comply with guidelines for fruit (n=803), vegetables (n=1,014), high-energy snacks (n=828) or fat (n=627) at baseline.

Results:

The basic condition was more effective in increasing vegetable intake (BT0-T1=13.84;P=.006/BT0-T2=12.48;P=.01) and decreasing fat intake (BT0-T1=-1.45;P=.006/BT0-T2=-1.38;P=.01) than the control condition. The plus condition was more effective in increasing fruit (BT0-T1=0.26;P=.01/BT0-T2=0.40;P=.001) and vegetable intake (BT0-T1=9.95;P=.046) than the control condition. For high-energy snacks, educational differences were found

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($F=2.77$; $P=.03$). Among high-educated participants the basic (BT0-T1=-0.87; $P=.03$) and plus (BT0-T1=-1.32; $P=.001$ /BT0-T2=-1.73; $P<.001$) conditions were more effective than the control condition. Among low/moderate-educated participants the basic condition was more effective than the control condition (BT0-T1=-0.96; $P=.004$).

Conclusions:

Both intervention versions improved dietary behaviors, for both high and lower educated participants. Both intervention versions could be suitable for implementation, but since the plus version did not outperform the basic version and providing environmental-level information is time-consuming, the basic version may be most suitable for future implementation. Further research is needed to identify working mechanisms and long-term effects of the intervention.

P468

Associations between snacking behavior, diet quality, and BMI in a community sample of working adults

Authors:

Timothy L. Barnes, Simone A. French, Lisa J. Harnack, Nathan R. Mitchell, Julian Wolfson

Purpose:

Studies have linked snacking behaviors to increased energy intake and excess weight. However, the extent to which snacking affects diet quality is only minimally understood. This study aimed to a) examine overall snacking behaviors (including total energy from snacking, frequency, time of day, and percentage of snacking energy intake by food groups and b) examine associations between snacking behaviors, diet quality, and BMI.

Methods:

Data from 233 adults in a worksite nutrition intervention were used to examine the association between snacking behaviors and diet quality using the 2010 Healthy Eating Index, and BMI using general linear models adjusted for demographic covariates.

Results:

There were no significant associations between total snacking energy, snacking frequency, or time of day in relationship with diet quality or BMI. However, percent of snacking energy intake of fruit and nuts was significantly positively associated ($p<0.05$) with overall diet quality. In contrast, percent of snacking energy intake from desserts and beverages was significantly negatively associated with diet quality. Lastly, percent of snacking energy from veggies was significantly associated with lower BMI and percent snacking energy from desserts was significantly associated with a higher BMI.

Conclusions:

Findings suggest that the frequency and time of day for snacking is not significantly associated with diet quality or BMI cross-sectionally. However, the proportion of snacking energy from certain food groups is significantly associated with diet quality and body weight. Future interventions may want to focus less on discouraging snacking between meals and more on the foods chosen for snacking episodes.

P469

Rate of energy consumption during ADL in Korean life style setting

Authors:

Kim Minyoung, Min Kyunghoon, Song Woojin, Jang Joonyoung

Purpose:

This study was conducted to measure VO₂, energy expenditure (EE) and metabolic equivalent of task (MET) values of activities of daily living and to compare each value between subjects and 9 activities.

Methods:

The subjects were normal adults with no specific medical history. Total 10 subjects were included (4 males, age: 20-30:3, 30-40:6, 40-50:1). We chose 9 daily activities that are relevant to Korean life style and tested it to subjects according to protocol respectively: Typing (typing 2500 words or 10 min), sleeping, folding laundry (folding uniform

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made of wool), dish washing, cleaning the room (using a mop), studying (reading and writing), walking (4km/hr), running (8 km/hr) and stair-climbing (each stair was 10cm). Duration of each activity was 10 minutes. Typing, folding laundry and studying were performed in sitting position. Sleeping was performed in side lying position while washing the dish, cleaning the room, walking, running and stair-climbing were performed in standing position.

Results:

There were high internal consistency among the subjects for identical activities (Cronbach $\alpha=0.89$). We obtained mean MET values of each activity: Sleeping (0.77), typing (1.33), folding the laundry (0.85), washing the dish (2.76), cleaning the room (2.78), studying (2.30), walking (4.23), running (7.83) and stair-climbing (6.89). VO2 values were proportional to EE value ($r=0.997$, $p=0.00$).

Conclusions:

We identified intensity levels of each activity according to the amount of EE and MET. We intend to provide a baseline for physical activity guideline development of normal adults. By integrating body weight, height, BMI in comparison to MET scores of different occupation groups in future studies.

P470

An investigation of the relationship between a bitter taste perception gene (rs10246939) and two nutrition intervention doses in a community trial

Authors:

Larissa Calancie, Jonathan Schisler, Thomas Keyserling, Ziya Gizlice, Beverly Garcia, Alice Ammerman

Purpose:

This study examines whether allele status of a single nucleotide polymorphism (SNP, rs10246939) in the TAS2R38 gene associated with bitter taste perception in vegetables affects: Vegetable consumption at baseline, and vegetable consumption after 6 months of exposure to either an intensive or a limited nutrition counseling intervention within the Heart Healthy Lenoir (HHL) study.

Methods:

SNP status was obtained from racially diverse HHL participants via DNA isolated from peripheral blood cells using the Infinium Human Omni Express Exome+ BeadChip (Illumina). Vegetable intake was determined using the Block FFQ Screener. Vegetable intake and covariates (age, gender, race, income) were available for 495 participants at baseline, and 382 at follow-up. ANOVA was used to test differences between groups.

Results:

Allele frequencies were: 28.7% TT (n=142 non-bitter-tasters), 45.1% TC (n=223 semi-bitter-tasters), and 26.3% CC (n=130 bitter-tasters). SNP status was not significantly associated with vegetable intake at baseline ($p=0.754$). After 6 months of intervention, there was a significant difference in vegetable intake from baseline to follow-up between groups defined by SNP status ($p=0.014$), with those having one or more SNPs in the target gene consuming fewer vegetables. There was no difference in vegetable intake comparing the intensive to the limited intervention groups ($p=0.238$). The interaction between SNP status and intervention group at 6-month follow-up was significant ($p=0.059$).

Conclusions:

SNPs in a gene associated with bitter taste perception significantly moderated participants' response to a nutrition intervention. Researchers may consider variation in bitter taste perception when designing interventions aiming to increase vegetable intake.

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P471

Barriers to healthy eating among native Hawaiians and Pacific Islanders in San Diego County

Authors:

Rosemarie Saldana, Christina Holub

Purpose:

Native Hawaiians and Pacific Islanders (NHPI) experience higher rates of obesity compared to other ethnic groups. NHPIs are almost three times more likely to be obese than the overall Asian-American population. Further, reports show that 41 percent of adult Pacific Islanders are obese having a BMI of 30 or greater. Understanding NHPI dietary habits is necessary to develop effective, culturally tailored health promotion programs aimed at improving nutrition and reducing obesity in this population.

Methods:

Through qualitative data collected from key informant interviews and focus groups, information was gathered to identify barriers to healthy eating habits among NHPIs in San Diego. Ten key informant interviews (N=10) and three focus groups (N=3; average 8 participants per group) conducted.

Results:

Key informant interviews identified access and affordability of healthy foods, cultural values and beliefs, and acculturation as barriers to healthy eating. Focus groups identified lack of knowledge about healthy eating and high-perceived difficulty to change current diet mostly linked to cultural values. Health conditions that were mentioned that are of most concern included diabetes, gout, and heart disease.

Conclusions:

NHPI cultural values and beliefs have a strong influence on healthy eating habits among this population. Furthermore, access and affordability of healthy foods and lack of knowledge about healthy eating also affect NHPI eating habits. The data collected informs the development of future NHPI tailored health promotion programs. These efforts can influence the adoption of healthy lifestyles and reduce obesity.

Adult Physical Activity

P472

Trends in pedometer-measured steps per day in Danish adults: 2007 to 2012

Authors:

Jeppe Matthiessen, Elisabeth Wreford Andersen, Anders Raustorp, Mette Rosenlund Sørensen

Purpose:

To examine time trends from 2007-2008 to 2011-2012 in pedometer-measured steps per day in a nationally representative sample of Danish adults.

Methods:

The study population comprised a random sample of 1739 individuals aged 18-75 years who participated in the Danish National Survey of Diet and Physical Activity 2007-2008 and 2011-2012. Pedometer data (sealed Yamax SW 200) were obtained for seven consecutive days and participants who provided at least 4 valid days of data (≥ 10 hr/d) were included in the analysis. A total of 1624 participants (48.2% men) met the inclusion criteria. All outcomes were analysed using descriptive methods and the primary pedometer-determined outcomes were also analysed using regressions models to take possible confounders into account.

Results:

In 2011-2012, Danish adults took on average 8341 (CI 8160; 8523) steps/day. A significant difference was observed between men (8480 steps/day) and women (8125 steps/day) in 2011-2012 ($P=0.046$). Mean steps/day decreased by 446 (-50 to 943; $P=0.077$) from 2007-2008 to 2011-2012. Further, the proportion taking $\geq 10,000$ steps/day decreased (from 34.8% to 29.3%; $P=0.109$) and the proportion taking $< 5,000$ steps/day increased (from 14.2% to 16.4%; $P=0.414$). These changes were primarily due to a reduced level of activity among women as men maintained their activity level.

Conclusions:

This nationally representative survey showed a tendency to a decline in daily steps. The increased proportion with a sedentary and low active lifestyle is worrying from a public health perspective. Targeted actions should encourage these individuals, especially women, to increase their level of physical activity.

P473

Changes in active travel among users of a new busway system: Preliminary findings from an intercept survey

Authors:

Calum Mattocks, Jenna Panter, Eva Heinen, David Ogilvie

Purpose:

New transport infrastructure may promote active travel and public transport use. The purpose of this study was to describe the socio-demographic characteristics of users of new transport infrastructure comprising a guided busway and traffic-free path for cycling and walking (the Cambridgeshire Guided Busway), and self-reported changes in travel habits since completion of the busway.

Methods:

Adult users were intercepted on the route and asked to complete an interviewer-led survey covering use of the busway, travel behavior, changes in physical activity and socio-demographic characteristics. These were summarised using proportions.

Results:

1721 respondents were interviewed in July and September 2012. Most users were below retirement age (74%) and in employment (69%). 57% of respondents were intercepted while using the guided bus, the remainder being intercepted while cycling (30%), walking (11%) or using another mode of transport (2%). 48% and 20% of path users reported increases in cycling or walking respectively since completion of the busway, while 1% reported more car use and 14% reported more bus travel. 13% and 23% of guided bus users reported increases in cycling or walking respectively, while 3% reported more car use and 58% reported more bus travel.

Conclusions:

A substantial proportion of respondents used the path for walking or cycling and reported increases in walking and cycling. New public transport infrastructure with traffic-free paths for walking and cycling may promote a modal shift from car use to active modes, but rigorous evaluations are required, using cohorts with control groups, to establish this.

P474

The cognitive and affective impact of receiving personalised multidimensional physical activity feedback within primary care

Authors:

Max Western, Oliver Peacock, Afroditi Stathi, Amanda Whittal, Dylan Thompson

Purpose:

Novel physical activity (PA) monitoring technologies can accurately capture the various dimensions of PA that are important for health. Presenting complex multidimensional PA feedback is potentially challenging. In this study, we generated personalised PA profiles and explored the impact of receiving rich visual informational feedback in terms of educational and motivational properties and cognitive-affective responses.

Methods:

Healthcare Professionals (HCPs: GPs, nurses and health trainers; n=15) and 40-70 year old male and female patients considered at risk of future chronic disease (as identified by the NHS Health Check; n=30) were provided with visual feedback depicting their personalised PA data. One-to-one semi-structured interviews were conducted to explore their

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attitudes towards physical activity and their responses to seeing personalised feedback. Thematic analysis was used to identify main themes and interpret the data.

Results:

Both HCPs and patients found that personalised PA profiles were both informative and motivational. Patients highlighted that the feedback enhanced their understanding of their own PA and in many cases were surprised by the discrepancy between their perceived and objectively measured PA levels. Participants who observed low activity levels, high sedentary time and missed PA recommendations generally expressed disappointment upon seeing their data and an instant desire to positively change their behavior. Participants that were shown to have surpassed PA recommendations expressed feelings of pleasure and reassurance.

Conclusions:

Technology-enabled personalised visual PA feedback and profiles appear to be informative and motivational for Patients and Healthcare Professionals. This approach represents a promising tool for behavior change interventions targeting physical activity.

P475

Fit minded peer mentors: Feasibility of a peer mentor facilitated book club for improving physical activity and self-worth in women

Authors:

Jennifer Huberty, Diane Ehlers, Katelyn Pellitteri, Lacey Rowedder, Danae Dinkel

Purpose:

The purpose of this study was to determine the feasibility of using peer mentor facilitators to deliver a book club intervention (Fit Minded [FM]) for improving physical activity (PA) and self-worth in middle-aged women.

Methods:

Forty-nine women aged 35-64 were randomized to FM Peer Mentors (intervention, n=22) or FM (control, n=27). Intervention groups were led by FM alumni trained by the research team. Control groups were led by the FM founder. Book clubs incorporated theory-based PA and self-worth promotion strategies previously determined effective for increasing PA in middle-aged women. Outcomes measured at baseline and 16 weeks included: Self-reported and objective PA, self-worth, social support, self-efficacy, and self-regulation. Intervention participants completed a satisfaction survey.

Results:

Thirty-one women (M age = 53.25 years) completed the study (n=16 intervention, n=15 control). Body mass index (BMI) differed between groups (intervention=35.97, control=26.83). Time effects were observed for self-reported PA, sedentary and light activity, knowledge and emotional self-worth, and self-regulation ($p < .001$). No time*group effects were observed in self-reported outcomes. When controlling for BMI, no effects were observed for objectively measured sedentary, light, or vigorous activity; however, the control group increased their light activity ($p = 0.02$) as compared to the intervention group. Over 90% of intervention participants agreed FM helped them increase their PA and that the peer mentors were competent, effective leaders.

Conclusions:

Findings indicate a peer mentor facilitated book club may be feasible for improving PA and self-worth in middle-aged women. Additional research testing the effectiveness of this approach is warranted, as this model has potential for widespread dissemination.

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P476

Appearance and mood associations with physical activity in pregnant women

Authors:

Anne Haase, Patricia Stevens

Purpose:

Physical activity (PA) during pregnancy may enhance mood, reduce anxiety, and improve body image satisfaction during pregnancy, but it is not clear the extent to which PA behavior before pregnancy affects those psychological variables during pregnancy. The aim was to examine whether PA before pregnancy (PA-B) predicts depression, anxiety, body image satisfaction, and PA during pregnancy (PA-D).

Methods:

Thirty-three pregnant women (15-29 gestation weeks) in the southwest UK completed the Leisure Time Exercise Questionnaire (LTEQ), State Trait Anxiety Inventory (STAI), Body Areas Satisfaction Scale (BASS), Appearance Evaluation Scale (AE), and Hospital Anxiety and Depression Scale (HADS). Correlation and linear regression analyses were used to assess associations.

Results:

Total self-report PA decreased from pre-pregnancy to during pregnancy ($p < 0.05$), with percentage of women who achieved the ACSM recommendations decreasing by 9.4% during pregnancy, compared to before pregnancy (42.4% vs. 33%). Linear regression showed PA-B was not found to predict body image satisfaction, depression, or anxiety during pregnancy, but did account for 65.8% of PA-D ($p < 0.001$). A moderate negative correlation between STAI and AE ($r = -0.42$, $p < 0.05$) was found, and linear regression produced a significant model showing AE to predict 17.3% of the variance in STAI ($p < 0.05$).

Conclusions:

Achieving PA recommendations decreased during pregnancy as did total PA, which did not provide potential psychological benefits to women during a time of physical and psychological change. Future research is needed into the motivation and promotion of exercise during pregnancy.

P477

A qualitative study on dog-walking as a form of physical activity for dog owners: Influencing factors, barriers, and how to encourage dog-walking

Authors:

Julia Campbell, John Dwyer, Jason Coe

Purpose:

Recent research has demonstrated that adult dog owners are a suitable target population for physical activity interventions due to the proportion of dog owners who do not walk their dogs regularly and the significant health benefits of dog-walking. However, few interventions have been developed to address this specific population. This qualitative study aims to discover what motivates dog owners to walk their dogs regularly, what barriers they face when it comes to walking their dog, and how to effectively promote dog walking among owners who do not walk their dogs. The results of this study will later be used to develop a print-based intervention resource.

Methods:

Semi-structured face-to-face and telephone interviews were conducted on 30 adult dog-owners which were audio-recorded and transcribed. Transcripts of the interviews were then analyzed using thematic analysis.

Results:

Thematic analysis will be conducted, but preliminary analysis has identified the following themes in regards to factors that influence dog-walking: Self-efficacy, obligation, motivation, attachment level, and social support from the dog. These results will later be used to guide the development of a print-based resource targeting dog owners to walk their dogs.

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Conclusions:

The results from this study will provide a better understanding of how to encourage dog owners to walk with their dogs more regularly which could increase physical activity levels among dog-owners as well as increase the proportion of Canadian adults who meet the physical activity recommendations of 150 minutes per week of moderate to vigorous physical activity.

P478

Systematic review of behavior change interventions and maintenance of physical activity

Author:

Marie Stopforth

Purpose:

This systematic review aimed to identify the key components of physical activity behavior change interventions that contribute towards maintenance of physical activity.

Methods:

A variety of combinations of search terms including the keywords of physical activity/exercise, maintenance/adherence, follow-up/ longitudinal were used to search numerous databases for relevant studies. Reference lists from the identified articles were also screened for titles that included the key terms. To be included in the review, studies were required to include a clear measure of physical activity, have a follow-up period of 6 months or longer, and be experimental or quasi-experimental in design.

Results:

Almost all of the interventions were based on the Social Cognitive Theory, with all successful interventions being theory-based in some capacity. Simple education and/or counselling interventions were the most effective at promoting sustained levels of physical activity. The majority of the interventions employed cognitive behavioral techniques such as goal setting, action planning, and the identification of barriers and coping strategies. Additionally, the use of self-monitoring through logs/diaries or pedometers, and the provision of individualised feedback were valuable strategies present in almost all interventions. The most effective counselling interventions employed the use of one-on-one Motivational Interviewing, often in combination with group education sessions in order to build and reinforce the importance of social support.

Conclusions:

This study provides an insight into the behavior change strategies that appear to be related to maintenance of physical activity. Practitioners should use these findings as guidance when planning interventions for long term behavior change.

P479

Physical activity promotion strategy for Japanese young women using stair climbing as an environmental sustainability intervention

Authors:

Hiroshi Matsumoto, Philip M. Wilson, Diane E. Mack

Purpose:

Physical activity is a health behavior that most Japanese young women do not participate in at recommended levels. The purpose of this study was to investigate the effectiveness of signs as an environmental sustainability intervention to encourage the use of stairs instead of escalators. The use of stairs and adjacent escalators was monitored at a women's university in Japan. A baseline period (two weeks) was followed by an intervention period (eight weeks) using motivating messages on the signs. Post-intervention data was gathered two weeks after removing the messages. Overall, 25,930 observations were made regarding the individuals using stairs or an adjacent escalator at the university during the study. The results indicated that stair use significantly increased during the intervention period when signs encouraging stair use were positioned at the point of choosing to use either the stairs or escalator. Stair use increased significantly between baseline and week 3 to week 4 of the intervention period from 6.9% to 8.6% ($X^2(1) = 10.59, p < 0.01$), but no other statistically significant increases were noted during week 5 to 10 of intervention period. Stair use

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decreased significantly during the post-intervention period compared to baseline (6.9% to 5.3%, $X^2(1) = 8.53$, $p < 0.01$). This intervention method was partially effective in encouraging physical activity in the form of stair usage among Japanese women attending university but the sustainability of behavioral change with respect to physical activity using method may be transient.

Adult Physical Activity & Nutrition

P480

A stress management-based approach to weight loss produces changes in weight, blood pressure, and perceived stress

Authors:

Kelly Webber, Laurel Mellin, Theresa Barry-Greb, Joy Vaught, Bailey Greene

Purpose:

Standard behavioral programs have shown effectiveness in producing weight loss, but limited success with maintenance. Stress has been shown to promote weight gain and obesity. Evaluation of weight loss approaches that target stress is needed. The purpose of this study was to determine if a stress management-based weight loss program, emotional brain training (EBT), would be successful in maintenance of improvements in weight, blood pressure, depression, perceived stress, and food addiction among obese adults.

Methods:

33 participants were randomized to one of two weight loss groups: A stress management-based approach (EBT), and a mindfulness-based eating approach, for a seven week intervention followed by a seven week follow-up period. At baseline, participants were 52.6 ± 10.5 years of age, $BMI = 36.3 \pm 3.9$ kg/m², 69.7% female, and 93.9% Caucasian. Weight, height, blood pressure, perceived stress, depression, and food addiction (Yale Food Addiction Scale) were measured at baseline, seven, and 14 weeks. Paired t-tests were used to examine changes over time.

Results:

The mindfulness-based approach did not produce significant changes in any measure at seven or 14 weeks. The stress management-based approach, EBT, produced significant changes in weight ($p=0.05$), blood pressure (systolic, $p=0.005$; diastolic, $p=0.05$), perceived stress ($p=0.04$), and food addiction ($p=0.02$) at seven weeks. The changes in weight, blood pressure, and food addiction were maintained at the 14-weeks.

Conclusions:

A stress management-based approach to weight loss, EBT, produced significant, sustained improvements in health outcomes. More in-depth research is needed in a larger population for a longer time.

P481

Are self-reported physical activity and dietary behaviors related to chronic health indicators within adult indigenous Siberians?

Authors:

Hannah J Wilson, Tatiana M Klimova, Valentina I Fedorova, Marina E Baltikhanova, William R Leonard

Purpose:

Self-report is commonly used to assess physical activity (PA) and dietary behavior, particularly in low resource settings. Globally, many low resource settings do not have a public health emphasis on physical activity and diet. A lack of emphasis on these behaviors may mean that they are less likely to be correctly recalled by participants, weakening their analytical use.

Methods:

Rural indigenous Siberian adults (Yakut) answered questions for their occupational physical activity requirements (OPA), frequency of leisure time physical activity (LPA), percentage of diet from purchased food, and basic demographics.

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Anthropometrics (body mass index (BMI), waist circumference (WC)) and blood pressure were used to measure health. Chi square and t-tests assessed sex differences in PA, purchased food and health indicators. OPA and LPA were grouped into three categories and compared to the health indicators using ANOVA. Correlations compared purchased food with health indicators.

Results:

The final sample size was 164 (47 men), mean age 51.1 (SD 14.5). Women had significantly higher BMIs and WCs and lower systolic blood pressure (SBP) than men with no significant difference in purchased food or frequency of LPA. Heavy manual labor was significantly more common in the men but jobs requiring walking or carrying were significantly more common in the women. OPA, LPA and purchased food were all unrelated to all health indicators in simple and multivariate analyses.

Conclusions:

Simplified questions of behavior within populations who do not receive messages on the importance of that behavior are likely not useful in predicting chronic disease risk.

P482

The effects of physical activity and nutritional interventions on metabolic syndrome risk factors

Authors:

Daniela Lopes dos Santos, Liziane da Silva de Vargas, Felipe Vogt Cureau, Fábio Saraiva Flôres

Purpose:

To evaluate the effects of a program involving nutritional follow up and physical training on the metabolic syndrome risk factors in adults.

Methods:

Fourteen adults of both sexes aged between 40 and 65 years old participated in the study. Anthropometric, plasma and blood pressure data were collected before and after a 16-week intervention. The participants were divided into Group 1, which had nutritional follow up, and Group 2, which had physical training comprising aerobic and resisted exercises, 3 times a week, during 60 minutes. The results were analyzed through Student's "t" paired test.

Results:

Group 1 presented significant decreases in body mass (-3,7 Kg; $p=0,001$), waist circumference (-3,93 cm; $p=0,040$), body mass index (-3,84%; $p=0,001$), systolic and diastolic blood pressure (-17,86 mmHg; $p=0,041$ and -14,28 mmHg; $p=0,035$, respectively), total cholesterol (-31,86 mg/dl; $p=0,012$) and HDL-c (-11,14mg/dl; $p=0,008$). Non-significant reductions were also observed in fasting glycaemia, triglycerides and LDL-c. In Group 2 no significant changes were observed, even though all variables showed decreases, except HDL-c.

Conclusions:

It was concluded that a 16-week nutritional follow up is effective in reducing anthropometric, lipid and blood pressure profiles in adults of both sexes.

P483

Apples, aerobics, and ABCs: Nutrition and exercise in promise neighborhoods initiatives

Authors:

Brean Flynn, Virginia Chomitz, Francine Jacobs

Purpose:

The link between academic achievement, nutrition and physical activity (PA) is generally underappreciated in school-based interventions. This research explores the extent to which recipients of the US Department of Education's Promise Neighborhoods (PN) Initiative considered nutrition and PA as pathways for improving academic and developmental outcomes in their applications. We assessed the extent to which recipients of the 2010 PN Planning Grant (PG) and 2011 PN Implementation Grant (IG) focused on issues of nutrition and PA in their program proposals.

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Methods:

This analysis utilizes a mixed-methods design, involving a literature review of the 26 successful grant narratives, an open-coding strategy to identify nutrition and PA-related discussion in the narratives, and a case study of a single PN grant recipient found to have the median amount of nutrition and PA-related discussion to document the use of nutrition and PA strategies in the program development process.

Results:

Across the highly selective group of funded PN applicants, the discussion related to nutrition and PA as a pathway for academic and developmental outcomes was limited (number of terms in PGs ranged from 3-46, averaging 15; and 6-184 for the IGs, averaging 98). The case study analysis identified six proposed nutrition and PA strategies, two of which were found to meet explicitly interweave nutrition and PA across all program design components.

Conclusions:

This research underscores missed opportunities by the U.S. Department of Education, school districts, and health professionals, to take advantage of nutrition and PA pathways to potentially improve school achievement.

Saturday, May 24, 2014 - 11:15-12:45

Adult Physical Activity & Nutrition in Workplace

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Perceived job pressures: A trigger for controlling motivational practices by exercise and health professionals?

Authors:

Frederico Z. Raposo, António L. Palmeira, Eliana V. Carraça, Luís Cerca, Marlene N. Silva

Purpose:

Pressures felt by the health & fitness professionals may play a detrimental role in the motivational strategies used with their clients, diminishing autonomy supportive practices (AUTS) and leading to controlling (CONTS) ones. This study sought to explore associations among perceived job pressures (PJB) and the use of CONTS. vs. AUTS.

Methods:

PoEMA is an observational, cross-sectional study. 180 health & fitness professionals (91 women) completed questionnaires covering PJB at 3 levels: Above (organizational constraints); within: Susceptibility to control (SC); interest-taking (IT) & authorship self-congruence (ASC); and iii) below: Perceptions of client's type of motivation (PCTM Auton. vs Cont.). Motivational Strategies were assessed concerning AUTS (structure (ST), autonomy-support (AS), involvement (INV)) vs. CONTS (controlling use of rewards (CUR), conditional regard (CR), intimidation (INT), excessive personal control (EPC)). Multiple regression analyses tested if PJB predicted AUTS and CONTS.

Results:

PA positively predicted CR, EPC & CONTS ($p < .05$), and negatively predicted the use of ST ($p = 0.033$). SC was associated with CONTS, CR, CUR & INT ($p < .05$). PCTM Cont. predicted CONTS, CUR, INT & EPC ($p < .05$). ASC and PCTM Auton., positively predicted AUTS, AS, ST & INV ($p < .05$), and negatively predicted CR & EPC ($p < .05$). INT positively contributed both to AUTS (AS, $p = .007$) and CONTS (CUR & INT, $p < .05$).

Conclusions:

Results highlighted the role of different PJP as possible antecedents of the use of CONTS, diminishing the use of AUTS, shedding some light on why although clients behaviorally and emotionally benefit when professionals support their autonomy, they are often controlling during practice.

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Employment grade and behavioral risk factors in “high tech” manufacturing working environments

Authors:

Fiona Geaney, Sarah Fitzgerald, Marsha Treacy, Janas Harrington, Ivan Perry

Purpose:

While higher employment grade is associated with better health outcomes in the Whitehall cohort and other studies, seniority was generally associated with significantly higher educational attainment in these studies. Many contemporary multinational manufacturing industries have a flat organisational structure, with high levels of educational attainment across the workforce but with demanding performance targets for managers. We have investigated the behavioral risk factor profile in managers compared to non-managers in multinational manufacturing workplaces in the Republic of Ireland.

Methods:

Cross-sectional data were obtained from 828 randomly selected employees (18-64 years, 82% with a third level qualification), participants in a dietary intervention study in four multinational manufacturing workplaces. The baseline questionnaire and measurements included diet (standard FFQ), physical activity, smoking, alcohol consumption, perception of workplace eating environments, BMI, central obesity, including lowest rib circumference measure and blood pressure.

Results:

Managers had an adverse behavioral risk factor profile compared to non-managers, with higher waist circumference ($p=0.012$), rib circumference ($p=0.003$) and waist to hip ratio ($p=0.047$), higher prevalence of overweight/obesity ($p=0.025$) and hypercholesterolemia ($p=0.031$) and higher alcohol consumption ($p=0.001$). No significant differences were detected in smoking prevalence, physical activity, diet quality or blood pressure between the two groups. A higher proportion of managers reported ‘always’ having difficulty eating during work due to inadequate time than non-managers (16.8% vs. 6.6%, $p=0.001$).

Conclusions:

The findings suggest that the protective “buffering” of senior staff in terms of health and wellbeing may be attenuated in contemporary more egalitarian workplaces.

P487

“Associations between body mass index and musculoskeletal disorders in body regions among factory workers with repetitive tasks”

Authors:

Isabel Moreira-Silva, Sandra Abreu, Rute Santos, Jorge Mota

Purpose:

The objective of this study was to verify the associations between weight status and musculoskeletal disorders in different body regions among workers.

Methods:

The sample comprised 203 factory workers. Anthropometric measures were assessed with standardized protocols and body mass index (BMI) was calculated. Participants were classified as nonoverweight ($BMI \leq 24.9 \text{ kg/m}^2$) or overweight/obese ($BMI \geq 25 \text{ kg/m}^2$). Musculoskeletal pain and related symptoms was assessed with the Nordic Questionnaire of Osteoarticular Symptoms.

Results:

The association of BMI and musculoskeletal pain and related symptoms was analyzed with logistic regression adjusted for age, gender, and job position. Overweight/obese participants were more likely to have musculoskeletal pain and related symptoms in the shoulders (odds ratio [OR] = 2.129, $p = .023$).

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Conclusions:

In our study, we found that overweight/obesity is positively associated with musculoskeletal pain and related symptoms in shoulders among workers. This study provides the insight to the health professionals about the relationship between BMI and musculoskeletal disorders, to formulate well-designed training programs to avoid overweight. Our results emphasize the need of worksite interventions to promote healthy weight as a way to prevent musculoskeletal disorders.

P488

Occupational health: A look at physical activity, nutrition, stress and tobacco use in six Canadian worksites

Authors:

Candace Bloomquist, Cora Janzen, Brent Rioux, Amanda Ror

Purpose:

To examine worksite physical policy, and cultural environments related to physical activity, nutrition, stress and tobacco use.

Methods:

Researchers used the Integrated Built Environment Assessment Checklist to assess the physical environment of each of the six worksites in this study. One-on-one consultations with managers and healthy workplace champions at each site provided employee perspective on the policy and cultural environments. Assessment of the cultural environment also included an on-line employee survey to assess physical activity, nutrition, stress and tobacco use. Lastly, physical activity levels were assessed using accelerometers on a subsample of employees.

Results:

Results revealed that the physical environment of some worksites supported employee health through the provision of facilities such as fitness rooms and staff lunchrooms/break rooms. Communication channels (i.e., posters, flyers and e-communication) that help to enable, promote, and motivate employees to practice healthy lifestyle choices were evident in most worksites. Manager consultations revealed that tobacco use policies existed at all worksites; however, managers and workplace champions did not cite any physical activity or nutrition policies at their worksites. The objectively measured level of physical activity observed in a subsample of employees who also completed an online survey revealed some disparity in self-reported versus objectively measured physical activity levels.

Conclusions:

Additional occupational health initiatives that are comprehensive in scope make healthy lifestyle choices the easy choices for employees where they work. Creating supportive environments and a workplace culture that supports the health of employees can help employers better achieve their mandates.

Adult Sedentary Behavior

P489

Lifelong trajectories and determinants of physical activity and sedentary behavior - a population based birth cohort study with objectively measured physical activity

Authors:

Raija Korpelainen, Tuija Tammelin, Anna Jauho, Juha Auvinen, Juha Oksa, Timo Jämsä, Sirkka Keinänen-Kiukaanniemi, Riikka Ahola

Purpose:

Planning of public health interventions requires knowledge on lifelong trajectories for physical activity (PA) and inactivity as well as on their associations with well-being. Current physical activity guidelines are primarily based on observational studies with PA being assessed via self-report. However, there appears to be a large disparity between self-reported and objectively measured physical activity. We present an ongoing cohort study to identify the lifelong determinants and trajectories of PA and sedentary behavior using objective PA measurements and self-reported wellbeing.

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Methods:

The study population consists of the Northern Finland Birth Cohort 1966 which is a longitudinal birth cohort originally including all those born in 1966 in Northern Finland (N=12058). The members have been monitored prospectively from the prenatal period onwards. Currently at the age of 46 years a large health examination is in progress (expected final N= 6500). PA is measured using Polar Active (Polar Electro, Finland) and Hookie AM20 (Hookie Technologies, Finland) for 14 days. Self-reported PA has been acquired at 14, 31 and 46 years, and sedentary behavior at 46 years. Key determinants studied in relation with PA lifestyle include academic achievement, grades, cardiorespiratory and muscular fitness, weight, smoking, alcohol use, diet, sleep, sociodemographics, life satisfaction, personality and temperament.

Results:

The results will show how physically active or inactive lifestyle are developed and what are the determinants of PA and sedentary behavior and its impact on subjective wellbeing.

Conclusions:

This study will generate new, evidence-based knowledge for promotion of PA and prevention of sedentary behavior at population level.

P490

Objectively measured physical activity and sedentary time associated with awareness and knowledge of the 2008 Physical Activity Guidelines for Americans

Authors:

Ho Han, Heon Tae Kim, Harold W. Kohl, III

Purpose:

An inherent assumption of evidence-based public health guidelines is that they will be used for beneficial health changes. There are no data available to assess the associations of awareness and knowledge of the 2008 Physical Activity Guidelines for Americans with physical activity behavior or with sedentary behavior.

Methods:

Data were obtained from 225 male and female college students. General awareness of guidelines and specific knowledge of the volume and intensity recommendations contained in the guidelines were assessed by questionnaire. Objective estimates of physical activity and sedentary time were measured by accelerometer. Multiple independent samples t-tests were conducted to describe the associations.

Results:

The percent of participants who met or exceeded the guidelines was 48.0%. The reported average time spent sitting was 8.2 hours per day. The percent of participants who reported being aware and knowledgeable of government physical activity (PA) guidelines was 24.4% and 9.3%, respectively. Awareness of the guidelines was not significantly associated with physical activity. However, overall physical activity was significantly higher among those participants who were knowledgeable of the guidelines than those who were not ($p<0.05$). No association was found between sedentary time and either awareness and knowledge of the guidelines.

Conclusions:

Awareness of the 2008 Physical Activity Guidelines for Americans was not associated with physical activity or sedentary behavior in college students. Knowledge of the guidelines was associated with physical activity participation however. More efforts to educate college students regarding specifics of physical activity guidelines appear to be warranted.

P491

Correlates of sedentary behavior in older adults living in the UK

Authors:

Yu-Ling Chen, Stuart Biddle

Purpose:

To exam the correlates of sedentary behavior in UK adults aged 65 and above.

Methods:

Data were baseline assessments from a longitudinal study. Physical activity (PA) was assessed by ActiGraph GT3X for 7 days. The potential correlates such as demographics, physical health and mental health are assessed by questionnaires.

Results:

A total sample size N=61 with mean age 72.07y. All were white European and 57% were female. 72% were married and 34% lived alone. 46% considered themselves in good health and 70% had one or more chronic disease. The average sedentary behavior (SB) time was 610min/d. There was no significant difference of SB, LPA and MVPA time between the demographics, physical health or mental health factors. SB time was significantly negatively correlated to MVPA ($r=-0.33$, $P=0.01$) and positively correlated to the number of adults the participant lived with ($r=0.32$, $P=0.02$). There was a significant difference in SB between unmarried (838min/d) and married (550min/d) ($t=3.94$, $p=0.001$) males, but not in females.

Conclusions:

This study shows that MVPA and marital status are correlated with the SB of a sample of generally healthy older adults. Males who were not married spent significantly more time engaged in SB than those who were married. But marital status does not make a difference for females. These findings may reflect an important life stage for males. More research is needed into non socio-demographic correlates of sedentary behavior.

P492

Physical activity-related psychosocial correlates of sedentary behavior in adults

Author:

Terry Conway

Purpose:

Research has identified psychosocial factors that are consistent correlates of physical activity (PA). It is unknown whether these factors might also be related to less sedentary behavior (SB). Well-established psychosocial correlates of PA were examined to see if they related to sedentary behavior independent of PA.

Methods:

Adults (n=2199) aged 20-65 (mean=45 years; 48% female; 26% ethnic minority) were recruited from neighborhoods that varied in "walkability" and income. Six PA-oriented psychosocial predictors were examined: Support from friends/family, self-efficacy, benefits, barriers, and enjoyment of PA. Sedentary outcomes included accelerometer-measured sedentary time (Actigraphs worn 7-days) and 3 self-reported leisure-time behaviors (television/video watching; time driving/riding in a car; total sitting time during past week). Time spent in moderate-to-vigorous physical activity (MVPA) also was measured (accelerometer). Mixed linear regression analysis adjusted for study design factors, demographics, accelerometer wearing time, and minutes of MVPA to control for covariation between psychosocial factors and physical activity.

Results:

Less sedentary time (accelerometer-measured) was strongly associated ($p<.001$) with higher perceived benefits and enjoyment of PA. Self-reported total sitting was related ($p\leq.019$) to all six psychosocial scales (direction being more positive PA-orientation related to less sitting time). Less television/video watching was related ($p\leq.016$) to social support from family and enjoyment of PA. Unexpectedly, PA-support from friends was related to more driving/riding time.

Conclusions:

Further research, particularly through prospective studies, is needed to identify the roles of these psychosocial correlates as determinants and/or consequences of physical activity and sedentary behavior; such evidence may help to identify novel implications for intervention.

P493

Associations of self-reported and objectively-assessed sedentary time with adults' quality of life and life satisfaction

Authors:

Kelli L. Cain, Terry L. Conway, Jacqueline Kerr, Brian E. Saelens, Lawrence D. Frank, Neville Owen, Kavita A. Gavand, James F. Sallis

Purpose:

There is emerging evidence that sedentary behaviors are related to indices of psychosocial well-being. This study examined associations of multiple self-reported and objectively-assessed measures of time spent sedentary with adults' life satisfaction and physical quality of life (PQOL).

Methods:

Participants (N=2119; mean age=45.2yrs, SD=10.9) were recruited from neighborhoods varying by walkability and income. They completed 6 PQOL items from the SF-12 and responded to a question about overall satisfaction with their life. Participants reported time spent in sedentary behaviors (TV/video watching; computer, car driving/riding time) and total time spent sitting in the last 7 days; they also wore Actigraph accelerometers for 7 days; average sedentary time per day and sedentary time accumulated in bouts of 20min or more were calculated. Mixed model regressions assessed associations with life satisfaction and PQOL, adjusting for study design, demographics, and accelerometer-measured MVPA and wearing time.

Results:

TV/video watching was negatively associated with life satisfaction and PQOL ($p<.001$). Computer time was associated negatively only with life satisfaction ($p<.001$); car time was unrelated. Accelerometer-derived sedentary bouts was associated negatively with life satisfaction ($p<.05$) and self-reported total sitting time was associated negatively with life satisfaction and PQOL ($p<.01$).

Conclusions:

Several elements of sedentary time - self-reported and objectively-measured - were negatively associated with physical quality of life and life satisfaction in adults. Evidence is particularly needed from prospective studies on the impact of TV and computer time on quality of life; these discretionary sedentary behaviors are potential targets for interventions aimed at improving quality of life.

P494

Take a stand: Targeting psychosocial mediators of change to reduce older adults' sedentary behavior

Authors:

Gina Merchant, Jordan Carlson, Suneeta Godbole, Michelle Black, Jacqueline Kerr

Purpose:

Sedentary behavior (SED) increases with age and is associated with poor health outcomes. This pilot aimed to help older adults reduce their SED by targeting psychosocial mediators of behavior change and providing behavioral feedback.

Methods:

Twenty-three sedentary older adults (Mage=59+6.25; 61% employed; 74% female; 74% White) were randomized to Sit Less or Stand More. ActivPals assessed mins.dy-1 spent sitting and number of sit-to-stand transitions.dy-1. Psychosocial mediators of SED were measured at baseline and follow-up (range: 1-5). Paired t-tests assessed changes in psychoso-

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cial constructs, and linear mixed models adjusted for wear time tested longitudinal associations between psychosocial constructs and SED.

Results:

The Sit Less group (n=12) reduced their sitting over the three-week intervention (-88 mins.dy-1, p=0.0001) and psychosocial changes were: Benefits (+0.19; p=0.32), self-efficacy (0; p=0.99), social support (+0.63; p=0.01), and barriers (-0.02; p=0.90). One-unit improvements in psychosocial attributes resulted in additional decreases in sitting by 14.25 (benefits; p=0.51), 15.90 (social support; p=0.41), 18.30 (barriers; p=0.43), and an increase in sitting by 27.3 (self-efficacy; p=0.37) mins.dy-1. The Stand More group (n=11) increased their sit-to-stand transitions (+10 stands.dy-1, p=0.0001) and psychosocial changes were: Benefits (+0.58; p=0.03), self-efficacy (+0.20; p=0.17), social support (+0.73; p=0.05), and barriers (-0.03; p=0.88). One-unit improvements in psychosocial attributes resulted in additional increases in daily sit-to-stand transitions by 0.83 (benefits; p=0.83), 10.47 (self-efficacy; p=0.05), 0.20 (social support; p=0.95), and 1.85 (barriers; p=0.61).

Conclusions:

This pilot provided some evidence that targeting psychosocial mediators of SED can facilitate behavior change. Reducing older adults' SED is expected to improve health outcomes.

Body Image/Weight Perception

P495

Gender and income differences in weight perception, diet, and physical activity among adolescents who accurately, overestimate, and underestimate their weight

Authors:

Michael Biehl, Carolyn Rider

Purpose:

This study examines how weight perception (accurate perception or overestimating-underestimating actual weight) varies by gender and income and how these differences influence dietary behavior and physical activity (PA) in California adolescents.

Methods:

Analyses were based on 986 California adolescents (age 12-17) from 2012 CalTEENS data from two different samples (low-income and higher-income). We created three weight perception categories (accurate perception, overestimate, underestimate) using BMI scores (based on self-reported height and weight) and a weight perception item (underweight, about-right, overweight). Three-way ANOVA analyses tested how weight perception interacts with gender/income on servings of fruits-vegetables, sugar-sweetened beverages, fast food, PA, and screen-time.

Results:

Most adolescents perceived their weight accurately (60%), however, 24% overestimated and 16% underestimated their weight. Significant 3-way interactions by weight perception, gender, and income were found for all diet and PA outcomes. Differences were found only for adolescents who overestimated or underestimated weight. For example, among those who underestimated weight, higher-income males ate less fruit compared to all other groups (low-income males and females, and higher-income females); no differences in fruit intake were found among those who perceived weight accurately or overestimated weight. Among those who overestimated weight, low-income males reported the most PA compared to all other groups (low-income females, and higher-income males and females); PA differences were not found among those who perceived weight accurately or underestimated weight.

Conclusions:

Results highlight the importance of gender/income on weight perception and how these factors influence dietary and PA behaviors for adolescents who underestimate and overestimate their weight.

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P496

Perceptions of a healthy appearance: Insights for behavioral interventions targeting fruit and vegetable intake

Authors:

Megan Rollo, Ross Whitehead, Kristine Pezdirc, Melinda Hutchesson, Gözde Ozakinci, David Perrett, Clare Collins

Purpose:

The colour of human skin is characterised by three pigments: Blood, carotenoids and melanin. Carotenoids predominantly impart yellowness (b^*), are abundant in the skin and are assimilated via fruit and vegetable (F&V) consumption. The benefits of adequate F&V intake are well documented, however consumption remains below recommendations. This study examined perceived health relating to changes in the carotenoid pigmentation of facial skin relative to that imparted by melanin which reduces skin lightness (L^*) and yellowness.

Methods:

Under the instruction to “make the face appear as healthy as possible”, participants completed two computer-based experiments on 49 trial faces (25 female). For each trial image, face colour was manipulated along two independent single axes (carotenoid and melanin) and one combined double axis (carotenoid X melanin).

Results:

Fifty-seven participants (4 Male; aged 27.9 ± 7.5 years) completed the study. For the single carotenoid axis, participants perceived the faces to be at their healthiest with increased skin yellowness ($\Delta b^* = +2.61 \pm 1.26$, $t_{48} = 14.51$, $p < 0.001$) equivalent to the colour change associated with an increased consumption of ~6.5 F&V portions per day (75g/portion). Participants removed melanin colouration in the single-axis melanin trial ($\Delta L^* = -0.19 \pm 0.26$, $t_{48} = -5.206$, $p < 0.001$). When carotenoid and melanin axes were simultaneously manipulated, average additive colour change showed a preference for increased facial skin yellowness and lightness ($\Delta b^* = +2.09 \pm 1.07$, $t_{48} = 13.76$, $p < 0.001$; $\Delta L^* = -0.15 \pm 0.30$, $t_{48} = -3.38$, $p = 0.001$; respectively).

Conclusions:

Participants showed a preference for increased carotenoid colouration in the appearance of facial skin compared to melanin. These findings support the use of novel appearance-based motivators to increase F&V intake.

Child/Adolescent Physical Activity & Nutrition

P497

The importance of parental influence in their child's extracurricular sports involvement

Authors:

Cristina Padez, Daniela Costa

Purpose:

The aim of our study is to understand the importance of role modeling and motivational factors that parents can offer to their children (age 6-10years-old) for physical activity (PA).

Methods:

We used a questionnaire in 224 parents from Coimbra, Portugal. SPSS 21 was applied in the analytical process.

Results:

We found that when they strongly agreed with the sentence “I often tell my children that doing sports is important” was significant in predicting children's involvement in extracurricular sports ($X^2 = 10,122$; $p = 0.006$). When at least one parent is involved in some PA it is more likely that their children are practicing extracurricular sports ($X^2 = 9,094$; $p = 0,011$). An additional result was that parents who practice more physical activity (measured as minutes per week) feel more responsible or try to act, in a greater extent, as a ‘sport role model’ to their children. This was visible in both mothers ($F = 2,509$; $p < 0,001$) and fathers ($F = 1,683$; $p = 0,017$).

Conclusions:

We can say that parents can affect their child's involvement in sports both direct and indirectly: Active parents seem more likely to have active children through giving advice, sharing sports activities, and providing more opportunities

while exposing them more directly to PA; and indirectly by praising their children and encouraging them to be more involved in PA. Studies have shown that many young people are not meeting the guidelines of daily exercise, and this is particularly true in female children. Our results are important in showing the importance of parental support of their child's physical activity.

P498

Length of sedentary breaks is associated with metabolic risk score in Portuguese children and adolescents: The LABMed physical activity study

Authors:

Rute Santos, Carla Moreira, Stewart Trost, Sandra Abreu, Luís Lopes, Carla Gonçalves, Luís B Sardinha, Jorge Mota

Purpose:

To analyze the association of the length of sedentary behavior breaks on metabolic risk score (MRS) in Portuguese adolescents (12-18 years).

Methods:

In 2012 we evaluated 400 adolescents (46% males) in a school-based study. We measured cardiorespiratory fitness (20m_shuttle-run test), blood pressure, height, waist circumference, fasting glucose and insulin, total cholesterol, HDL-cholesterol, triglycerides and C-reactive protein. The HOMA-IR, waist-to height and total cholesterol/HDL-cholesterol ratios were calculated. For each of these variables, a Z-score was computed by age and sex. Cardiorespiratory fitness Z score was multiplied by -1. MRS was constructed by summing all the Z scores. We also assessed sedentary behavior, physical activity (accelerometry, Evenson's cut points), pubertal status (Tanner stages), socio-economic status (Family Affluence Scale), tobacco consumption and adherence to a Mediterranean diet (KIDMED score).

Results:

Accelerometer wear time was 13.20(\pm 1.40)h/day, of which an average of 8.78(\pm 1.41) h/day was spent sedentary, and of 0.75(\pm 1.36)h/day in moderate-to vigorous physical activity. Sedentary time was broken up an average of 152.2(\pm 31.13) times/day, with a mean break duration of 1.77(\pm 1.32)min. Linear regression analysis showed that average length of sedentary breaks was associated with MRS ($B=-2.607$, $p=0.023$) only in girls after adjusting for total sedentary time, moderate-to vigorous physical activity, accelerometers wear time, gender, socio-economic status, Mediterranean diet, tobacco consumption, age and pubertal status.

Conclusions:

The length of sedentary breaks was beneficially associated with MRS, regardless of total sedentary time and moderate-to vigorous physical activity.

P499

Gender differences in willingness to participate in outdoor physical activity in unsafe environments

Authors:

Jessica Sheldrake, Marie Stopforth

Purpose:

This study aimed to investigate gender perceptions of outdoor environments and the impact of on willingness to participate in physical activity (PA). Specifically, the study sought to identify differences in willingness to participate in PA between males and females in various unsafe outdoor settings.

Methods:

186 students (male=113, female=55) rated their willingness to walk, jog, and cycle in five different unsafe outdoor settings: No safe pathway [NP]; presence of heavy traffic [HT]; unlit/dark environment [D]; poor weather conditions [WC]; and deprived neighbourhoods [DN]. Images of each setting were displayed and participants rated their willingness to participate in PA on a likert scale of 1-5. A series of independent t-tests were carried out to determine significant differences in willingness to participate in PA in each setting.

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Results:

Independent sample t-tests showed that there were significant differences between males and females in their willingness to exercise in NP ($t=10.826$, $p<.000$), HT ($t=10.34$, $p<.000$), D ($t=12.021$, $p<.000$), WC ($t=9.115$, $p<.000$) and DN ($t=11.399$, $p<.000$) conditions. Effect sizes were small to moderate ranging from 0.33-0.47. The means indicated that males were significantly more willing to exercise in all 5 unsafe environments than females.

Conclusions:

The findings indicate that females may experience additional barriers to males when they are faced with an environment that is deemed 'unsafe'. This has implications for those advising on/prescribing PA and for town and city planners who wish to 'plan in' physical activity opportunities.

P500

Correlates of active and non-active gaming among dutch gaming adolescents

Authors:

Monique Simons, Emely de Vet, Mai Chinapaw, Michiel de Boer, Jaap Seidell, Johannes Brug

Purpose:

Active games seem to be a promising alternative to non-active games to promote physical activity and reduce sedentary behavior. So far, little is known about correlates of active and non-active gaming among adolescents. Therefore we examined potential correlates of both active and non-active gaming in adolescents informed by Theory of Planned Behavior, Self Determination Theory, Technology Acceptance Model and Habit Theory.

Methods:

A survey assessing game behavior and potential correlates was conducted among adolescents (12-16 years, $n=353$). Multivariable, multilevel logistic regression analyses, adjusted for demographics (age, sex and educational level of adolescents), were conducted to examine correlates of active gaming ≥ 1 hour/week and non-active gaming >7 hours/week.

Results:

For active gaming (≥ 1 hour per week) we found the following statistically significant correlates: 'Attitude towards active gaming', 'attitude towards non-active gaming' (negative association), 'habit regarding playing video games', 'descriptive norm active gaming of friends', 'descriptive norm active gaming of brothers/sisters' and 'game engagement'. With respect to non-active gaming (>7 hours per week), statistically significant correlates were: 'Attitude towards non-active games', 'habit regarding playing video games', 'descriptive norm non-active gaming of friends' and 'image regarding non-active gamers'.

Conclusions:

It seems that both types of gaming are habitual behaviors and that modelling behavior of friends is important for game behavior in adolescents. Findings on game attitude suggest that it might be difficult to transform non-active gamers into active gamers. The findings provide important (preliminary) direction for the development of effective intervention strategies for replacing non-active gaming by active gaming among adolescents.

P501

Using Olympic sponsorship to promote physical activity to children. The 'Mascotathon' program

Author:

Paul Gately

Purpose:

The WHO(2005) Diet & Physical Activity (PA) Strategy and UK NICE(2009) guidance on PA have called on public and private stakeholders to seek opportunities to directly promote PA participation and raise awareness of its associated benefits.

Methods:

The 'Mascotathon' program was a 20 week PA campaign established by a global restaurant chain as part of their London Olympic Games sponsorship, involving 3 PA promotion elements: (1)Distribution of 6 activity/counter toys. (2)National

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tour of PA events; and (3) Website (child/parent registration) promoting games and activities. A small non-representative sample of parents (n=310) were interviewed at 8 weeks.

Results:

The 3 promotional activities generated: Distribution of 9.4million activity toys; 22,644 children participated in PA sessions; and registered 1million website hits. 8 weeks post campaign, 54% of parents reported their child/ren had played with the activity toy at least 2-3 times per week for the previous 8 weeks. Only 4% of parents reported their child had not used the activity toy at all. 74% of parents reported that the activity toy, and the program in general, was either “appropriate” or “very appropriate”.

Conclusions:

These data suggest that the program met the recommendations of the WHO and NICE by creating awareness of and promoted PA. Parents reported changes in PA at 8 weeks. The scale of impact of this program is significant and comparable to other national campaigns such as the UK Department of Health Change4Life program which reported the distribution of 6 million health promotion items and 2 million website hits in year 1. Further research of their engagement capabilities and long term impact on behaviors are recommended.

P502

The effect of motor skills training on self-perceived physical competence in children with developmental coordination disorder

Authors:

Jie Yu, Cindy H.P. Sit, Angus F. Burnett, Amy S. Ha, Catherine M. Capio

Purpose:

Positive self-perceptions of physical competence are important for persistent motor attempts and physical activity in children. Children with developmental coordination disorder (DCD) who are diagnosed as having motor impairments exhibit low self-perceived physical competence (SPC). Fundamental movement skills (FMS) are foundations for developing more complex movements. This study determined whether FMS training in children with DCD resulted in improved SPC when compared to typically developing (TD) children.

Methods:

Participants include 84 children (7-10 years) who were allocated into either FMS training group (22 DCD-FMS, 17 TD-FMS) or control (C) group who underwent regular physical education lessons (16 DCD-C, 29 TD-C). FMS training was conducted within a school setting for 6 weeks, twice per week and 35 minutes per session. FMS proficiency was tested using the Test of Gross Motor Development-2, while SPC was measured using the Physical Self-Description Questionnaire. Testing was conducted three times (i.e., baseline, 7th-week, 13th-week). Repeated-measured ANCOVA was used to determine the effect of the intervention.

Results:

At baseline, children with DCD showed poorer FMS and SPC than TD children. Post- intervention, the DCD-FMS group scored significantly higher in jumping (7th-week) and catching (both 7th-week and 13th-week) when compared to the DCD-C group (both $p < .05$). FMS training groups (DCD-FMS, TD-FMS) showed significantly higher self-perceived physical coordination, physical strength, and physical fitness than the control groups at 7 weeks post-intervention (all $p < .05$).

Conclusions:

FMS training can effectively improve jumping and catching in children with DCD and improved some SPC variables in both children with DCD and TD children.

P503

Weight reduction in children with asthma and overweight using a multifactorial intervention: A challenging task

Authors:

Maartje Willeboordse, Kim DG van de Kant, Frans ES Tan, Sandra Mulken, Liesbeth van der Ploeg, Onno CP van Schayck, Edward Dompeling

Purpose:

There is increasing evidence that obesity is related to asthma development and severity. However, it is largely unknown whether weight reduction contributes to improvements in asthma outcomes, especially in children. We investigated the effects of a multifactorial weight reduction intervention on body weight and clinical asthma characteristics in children with asthma and overweight/obesity.

Methods:

An 18 month weight reduction RCT (entitled MIKADO) was conducted in 87 children with asthma and overweight/obesity. The intervention consisted of an intense programme with sport-, lifestyle-, parental- and individual sessions. Every 6 months, measurements of anthropometry, lifestyle parameters and lung function were assessed. Analyses were performed with linear mixed models for longitudinal analyses.

Results:

The majority of the lifestyle parameters (including diet, step count, physical fitness) did not change over time in either intervention or control group. After 18 months, BMI-standard deviation score decreased in the intervention group with -0.14 ± 0.29 point ($p < 0.01$), and in the control group with -0.12 ± 0.34 point ($p < 0.01$). This decrease was not statistically different between groups ($p \geq 0.05$). Clinical asthma characteristics (including asthma control, quality of life) and lung function improved over time, although equally in the intervention and control group (all parameters $p \geq 0.05$). Only improvements in the lung function index forced vital capacity were significantly greater in the intervention than the control group ($p < 0.05$).

Conclusions:

Our intervention demonstrated limited effects on both weight reduction and lung function. Possible reasons for the low effectiveness are high attrition rates, low intervention compliance, and weight reduction in the control group.

P504

Addressing childhood overweight and obesity in Northwestern Ontario: What is being done and where to next?

Authors:

Alyssa Fairservice, Erin Pearson, Shauna Burke

Purpose:

Childhood obesity rates are significantly higher in Northwestern Ontario (NWO) in comparison to the rest of the province. Treatment interventions administered through primary care offer an excellent opportunity to address obesity-related health problems. Yet, there is a paucity of research examining the perceptions of primary care providers serving on the “front lines” against Canada’s obesity epidemic among children and youth. Thus, the purpose of this study is to perform a comprehensive needs assessment aimed at identifying standard care practices, concerns, and priorities for treating childhood overweight and obesity in Thunder Bay, Ontario.

Methods:

This qualitative study will consist of four one-hour focus groups involving up to eight primary care providers each (e.g., physicians, nurses, dietitians). Participants will be recruited from local health centres that provide services to paediatric populations in early March 2014. A trained moderator will follow a semi-structured interview guide; all sessions will be digitally recorded, transcribed verbatim, and analyzed using inductive content analysis.

Results:

The attitudes, resources, and assessment practices identified by the health professionals in our study, with regard to childhood obesity treatment in a remote city in Ontario, will be discussed.

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Conclusions:

Assessing the views and needs of primary care providers is a critical step in the treatment planning process and will assist in setting priorities for future programming. It is expected that this pilot study will offer unique insights to aid in the development of childhood obesity interventions for Thunder Bay, as well as NWO communities that are isolated from urban centres.

P505

Active video games as a tool to prevent excessive weight gain in adolescents: A randomized controlled trial

Authors:

Monique Simons, Johannes Brug, Mai Chinapaw, Michiel de Boer, Jaap Seidell, Emely de Vet

Purpose:

Active video games may help to convert sedentary time into more active time, and in this way contribute to the prevention of excessive weight gain. This study sought to evaluate the effects of an active game intervention on anthropometrics in adolescents.

Methods:

270 gaming adolescents (12-17 years old) were randomly assigned to an intervention group (n= 142) (receiving active games, as well as an encouragement to play) or a waiting-list control (n=128). BMI-SDS (SDS=adjusted for mean standard deviation score), waist circumference-SDS, hip circumference and sum of skinfolds were measured at baseline, four and ten months follow up. Multi-level regression analysis were conducted following intention to treat principles and adjusting for baseline outcome value, age, sex, ethnicity and adolescent educational level.

Results:

Preliminary analyses indicate no significant intervention effects on SDS-waist circumference (B=0.039, 95%CI: -0.05 to 0.13) and hip circumference (B=0.39, 95%BI: -0.18 to 0.96), a significant adverse intervention effect on SDS-BMI (B=0.074, 95%CI: 0.008 to 0.14), and sum of skinfolds (B=3.22, 95%CI: 0.27 to 6.17) at 10 month follow up, in favour of the control group.

Conclusions:

The preliminary results indicate that the active game intervention was not effective in improving anthropometric parameters at ten months follow-up. Further analyses will be conducted to evaluate effects on physical activity, sedentary time, snacking and sugar-sweetened beverages consumption. Next, a process evaluation will be conducted.

P506

Timing of complementary food introduction, intake of protein in infancy and the risk of childhood overweight

Authors:

Camilla Schmidt Morgen, Jennifer Lyn Baker, Anne-Marie Nybo Andersen, Kim F. Michaelsen, Thorkild I.A. Sørensen

Purpose:

Infant feeding may affect the risk of overweight and obesity in childhood. We aimed to examine whether the timing of the introduction of complementary food, the total intake of protein and intake of protein from dairy products during infancy (obtained at 18 months of age) were related to overweight, categorised according to the IOTF reference, at age 7 years.

Methods:

The associations were analysed in a cohort consisting of live-born singleton children in the Danish National Birth Cohort, born between 1997 and 2003, (n= 19 088). Information on timing of introduction and type of complementary feeding (meat, fish and dairy products) and potential confounders (BMI at 12 months, duration of breastfeeding, maternal smoking, maternal pre-pregnancy BMI and maternal educational level) originated from interviews during and after pregnancy and from national registers. Logistic regression analyses were used to estimate the associations and the analyses were made separately for boys and girls.

Results:

Introduction of complementary food before 4 months was not associated with an increased risk of overweight. A total daily intake of protein above the 90th percentile (28.5 grams) was associated with an increased risk of overweight at age 7 years; for boys: OR (95% CI) 1.45 (1.17; 1.79) but not for girls: OR 0.87 (0.69; 1.10). An intake of protein from dairy products above the 90th percentile (19.5 grams) was not associated with childhood overweight.

Conclusions:

A high intake of protein during the complementary feeding period may increase the risk of childhood overweight for boys.

P507

Sedentary and active behaviors of Portuguese adolescents: An ecological momentary assessment cross-sectional study

Authors:

Adilson Marques, João Martins, Frederico Z. Raposo, Francisco Carreiro da Costa

Purpose:

To describe time and prevalence of sedentary and active behaviors in Portuguese adolescents, using ecological momentary assessment (EMA).

Methods:

A cross-sectional study was conducted with 651 adolescents (378 girls) aged 12-14 (Mage 13.0±0.9). EMA method allowed to capture adolescent's current behavioral episodes with 15 minutes time intervals, from 07:00 a.m. to 00:45 a.m., of 3 weekdays and weekend days. Data were collected during Springfield of 2013. To identify gender differences t test was used.

Results:

On weekdays studying occupied most time (boys 114.5, girls 136.4 min/day, $p=0.004$). TV viewing occupied the most sedentary leisure-time (boys 97.8, girls 59.7 min/day, $p<0.001$), followed by computer use (boys 42.7, girls 21.7 min/day, $p<0.001$). On average, 31.8 min/day were spent in sports practice (boys 40.9, girls 24.0 min/day, $p<0.001$). On weekends, time studying was also high (boys 110.0, girls 144.7 min/day, $p<0.001$). Boys spent significantly more time than girls on computer use (boys 139.6, girls 91.3 min/day, $p<0.001$), but not on TV (boys 145.8, girls 133.5 min/day, $p=0.116$). Inversely, girls spent significantly ($p<0.05$) more time talking (boys 27.1, girls 37.6 min/day) and reading (boys 8.1, girls 3.5). Time dedicated to sports was 66.7 min/day for boys and 38.1 min/day for girls ($p<0.001$).

Conclusions:

Portuguese adolescents have multifaceted lives, and their leisure-time is occupied mainly with sedentary activities. The time prevalence of sedentary and active behaviors is different between boys and girls. Future interventions should consider these differences to effectively promote active lifestyles, i.e., increasing active behaviors and reducing time spend in sedentary behaviors.

P508

Anxiety in children with overweight and obesity in a disadvantaged urban setting

Authors:

Carmen Mena, Adina Radosh, Arely Vergara, Ericka Escalante

Purpose:

Childhood obesity is a complex disease that may lead to mental health illness such as depression and anxiety, which have a negative impact on self-care. Mental health is well documented as a psychosocial associated factor for the development of Chronic Diseases like obesity. As part of a research project from the Iberoamericana University, we evaluated anxiety level in children from low socio economic status in elementary schools in Santa Fe Town, in Mexico City.

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Methods:

This was an empirical study with children from 6 to 12 years old (n=312) in two public schools from a disadvantaged community in Mexico City. A Manifest Anxiety Scale for Children (CMAS-R scale from Reynolds & Richmond, 1997) was applied and in both overweight and normal weight children, a logistic regression model was run.

Results:

Children in risk of obesity showed 2.66 higher anxiety levels compared with normal weight children (controlled by sex and scholar grade). 52% of the sample presented manifest anxiety according, being the most important dimensions: uneasiness (31%), falsehood (26%), physiological anxiety (26%) and social concern (17%).

Conclusions:

These results suggest the possibility of an intervention with children and their parents, including activities for the proper management of anxiety in order to allow the development of life skills for self health care.

P509

Systematic review of parental involvement in children's dietary interventions: Is external validity information reported?

Authors:

Richard R. Rosenkranz, Chelsey R. Schlechter, Amy N. Ptacek, David A. Dzewaltowski

Purpose:

Interventions designed to improve child dietary intake frequently include parental components. The reporting of external validity information in published interventions may enhance understanding of issues related to reaching and impacting parents to improve children's diets. The aim of this systematic review was to evaluate the reporting of reach, adoption, implementation, and maintenance (RE-AIM) of the omnibus dietary intake intervention and the associated intervention component targeting parents.

Methods:

Twenty four studies from Hingle and colleagues' (2010) systematic review, plus an additional 13 studies from 2008 through 2013 met current criteria. Original database searches plus a replicated update in Pubmed, PsychINFO, and Cochrane Libraries identified 2551 articles, and two independent raters assessed RE-AIM component reporting among the 37 included articles. Raters extracted RE-AIM data for each article's omnibus dietary intervention, and for each article's parent intervention component.

Results:

Median reporting of RE-AIM elements for the omnibus intervention was 32%, with highest reporting for effectiveness (81%) and adoption (68%), followed by reach (54%), implementation (32%), and maintenance (4%). Median reporting of RE-AIM elements for the parental intervention component was 15%, with highest reporting for effectiveness (24%) and implementation (22%), followed by reach (16%), and maintenance (0%). The least frequently reported RE-AIM subcomponents included intervention cost, intervention sustainability, exclusion criteria for participants and settings, and population representativeness.

Conclusions:

Current RE-AIM reporting among children's dietary interventions is inchoate, especially for parental components. Increased focus should be placed on reporting of internal and external validity information, to enable better translation of research to practical applications.

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P510

Correlates of objectively measured sedentary and physical activity behaviors in Spanish children

Authors:

Susana Aznar, Ana Queralt, Javier Molina-García

Purpose:

To evaluate multi-level models of correlates of sedentary behavior (SB) and physical activity (PA) during weekdays and weekend among boys and girls.

Methods:

The study involved a total of 420 children (mean 9.2 years; 52.9% girls), from the community of Madrid, Spain. The study sample was randomly selected by a two-stage sampling strategy. SB and PA were objectively measured using accelerometers. Potential correlates were assessed by questionnaire. Data were collected in 2008-2010. Multivariable regression analyses were performed to analyze associations among variables.

Results:

Father's physical activity was a negative correlate of weekday SB for boys. In girls group, competence perception and television viewing were negatively and positively, respectively, associated with SB during weekdays. Boys with higher friend support and better neighborhood perceptions spent less time in weekend SB. Regarding PA, body mass index was a negative correlate during weekdays and weekend for boys. Parent support was positively related to weekend PA for boys. Neighborhood perceptions were positively associated with weekday PA for girls, whereas competence perception was a correlate during weekend.

Conclusions:

Different psychosocial and environmental correlates of SB and PA were identified. Present findings are promising targets for interventions to improve children's health.

P511

Summertime changes in sleep, physical activity, and BMI in urban minority girls

Authors:

Carolyn Bates, Amy Bohnert, Amanda Ward, Kimberly Burdette, Lara Dugas

Purpose:

Seasonal variations in weight gain among children are well documented. Urban minority and overweight youth are at higher risk for weight gain during the summer months, which may result from decreases in physical activity (PA) and sleep. While research has established links between PA, sleep, and BMI, the current study is the first to examine associations between summertime changes in these variables.

Methods:

Participants (n=25) were 10-14-year-old low-income urban girls enrolled in a summer sports camp program. Most identified as African-American (n=11) or Latina/Hispanic (n=12) and nearly half (48%) were overweight/obese. Data was collected in the week prior to camp (T1) and during the final week of camp (T2). Anthropometric measurements were used to calculate zBMI. Actigraphs (GT3X) were used to measure PA (e.g., vigorous activity; VPA) and sleep (e.g., duration, efficiency).

Results:

Sleep duration increased from T1 to T2 ($t(24)=2.23$, $p=.036$), as did VPA ($t(23)=3.22$, $p=.004$) and zBMI ($t(23)=2.41$, $p=.024$). zBMI change was negatively correlated with sleep efficiency change ($r=-.41$, $p=.045$). Controlling for T1 zBMI, only sleep efficiency change ($\beta=-.057$, $p=.04$) was significantly associated with T2 zBMI. VPA change predicted T2 zBMI after controlling for T1 zBMI (F-Change (1,20)=5.46, $p=.03$).

Conclusions:

Taken together, results indicate that increases in PA and sleep efficiency may be powerful protective factors against summer weight gain in an at-risk sample.

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P512

Dietary habits and prevalence of overweight and obesity in a child population from the primary school Plan de San Luis from Tijuana, Mexico

Authors:

Elvira-Ivonne Murillo-Rabago, Lucia-Margarita Valenzuela-Salas, Amanda Davila-Lezama, Janneth-Jackeline Muñoz-Vázquez, Amaranta-Yaritza Morales-Suarez, María-Carmen Hoyos-Luna

Purpose:

The purpose of this study was to identify dietary habits and evaluate their relationship with the prevalence of overweight and obesity in children from the primary school San Luis Plan in 2013.

Methods:

A cross-sectional study was conducted to 110 scholars, where a survey was applied to obtain information of their dietary habits. Height and weight were assessed by conventional methods and BMI (kg/m^2) was calculated. The results were analyzed using the Spearman correlation coefficient with SPSS version 19.0.

Results:

The average age was 10.2 years, the mean of BMI was 18.44 ($12.6\text{-}34.4 \text{ kg}/\text{m}^2$), the prevalence of overweight was 16.4% and obesity was 19.1%. The 5.5% consume food once a day, 18.2% twice, daily, 63.6% three times, 12.7 % more than three times. From this population, the 39.1% consume healthy foods and 60.9% consumed unhealthy foods. During breakfast at home, 54.6% consumed healthy foods, 40.9% unhealthy and 4.5% skipped breakfast before school. While in school, 25.5% consumed healthy foods and 74.5% unhealthy. The number of times consuming foods per day ($p<0.05$), unhealthy foods daily ($p<0.005$), had breakfast at home before school ($p<0.01$) and unhealthy breakfast ($p<0.005$) were associated with lower BMI.

Conclusions:

These findings indicate that consuming foods in a suitable number of times and having breakfast at home may decrease the BMI. Also, unhealthy food consumption is not related to the increase of BMI in this population, where it can be inferred to be the amount of food consumed whether they are healthy or not.

Children Sedentary Time

P514

Early childhood TV viewing and subsequent BMI trajectories to mid-adulthood in the 1970 British Cohort Study

Authors:

Silvia Costa, William Johnson, Russell M Viner

Purpose:

To investigate whether TV viewing more than recommended thresholds (<2 hours/day) in early childhood is associated with trajectories of overweight and obesity (OW/OB).

Methods:

Participants from the 1970 British Cohort Study with complete BMI data at age 10, 26-30, 34 and 42 years ($n=4174$; 2392 females) were selected and their BMI classified according to the International Obesity Task Force cut-points. Trajectories of OW/OB were categorised as: "Never OW/OB", "mid-adulthood onset" (OW/OB at 42 years only), "early adulthood onset" (OW/OB from 26, 30, or 34 years), "always OW/OB", and "other". Of those selected participants, 3347 (1926 females) had information on TV viewing at 5 years and were included for analysis. Multinomial logistic regression was used to assess associations between excessive TV viewing (≥ 2 hours/day) and trajectories of OW/OB (outcome).

Results:

More boys watched TV for ≥ 2 hours/day at 5 years than girls (32.3% versus 28.3%; $p=0.01$). Excessive TV viewing significantly increased the risk of being always OW/OB both in males (relative risk ratio=2.52; 95% confidence interval: 1.50-4.24) and females (1.74; 1.16-2.61), and of early adulthood onset in females (1.39; 1.10-1.75), compared to never

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being OW/OB in unadjusted analyses (all $p < 0.01$). The increased risk of being always OW/OB remained significant for males (2.45; 1.40-4.29; $p = 0.002$) but not females (1.37; 0.89-2.12; $p = 0.15$) when adjusted for childhood socioeconomic status, maternal education and maternal BMI in childhood.

Conclusions:

Excessive early childhood TV viewing is associated with unhealthy later weight trajectories and likely represents an important preventive opportunity that requires further study.

P515

The impact of screen time on dietary intake and obesity prevalence in low-income WIC children

Authors:

Stacey Lee, Grace Shearrer, Shannon Whaley, Maria Koleilat, Jaimie Davis

Purpose:

Few studies have examined how watching TV and playing video games relates to dietary intake and obesity prevalence concurrently. The aim of this study was to examine the relationship between screen time, dietary intake and obesity prevalence in low-income, primarily Hispanic young children.

Methods:

The data were obtained via a 2011 phone survey with caregivers of low-income children (2-4 y) participating in the Women, Infants and Children (WIC) program in the Los Angeles County. The final sample included 2295 children, 48% female and 83% Hispanic. Chi-square and Spearman correlations were used to assess the relationships between screen time and dietary intake (including fast food, vegetable, fruit, milk, sweetened milk, 100% juice, juice not 100%, sweet drinks, soda, and sweet grain intake) and obesity prevalence, separately.

Results:

TV viewing time was inversely related to vegetable intake ($r = -0.07$; $p = 0.00$) and positively related to sweetened milk ($r = 0.08$; $p = 0.00$), 100% juice ($r = 0.12$; $p = 0.00$), fruit drinks ($r = 0.12$; $p = 0.00$), soda ($r = 0.09$; $p = 0.00$) and sweet grains ($r = 0.17$; $p = 0.00$). Video game playing was positively correlated with sweetened milk ($r = 0.07$; $p = 0.00$), fruit drinks ($r = 0.05$; $p = 0.02$) and sweet grains ($r = 0.07$; $p = 0.00$). There were no significant relationships between TV or video gaming and obesity and/or overweight prevalence.

Conclusions:

These findings suggest screen time is linked to unhealthy dietary patterns, particularly increased added sugar consumption, in low-income young children. Future interventions should focus on decreasing screen time in young children in order to improve dietary intakes.

P516

Longitudinal changes in objectively assessed sedentary behavior and their relationship with adiposity in youth: A systematic review

Authors:

Chiaki Tanaka, John Reilly, Wendy Huang

Purpose:

This review aimed to determine longitudinal changes in objectively measured sedentary behavior (SB), and to examine their associations with adiposity in children and adolescents.

Methods:

A literature search of studies reporting on: (1) Longitudinal changes (with at least 12-month follow-up period) in objectively measured SB; and (2) associations between change in sedentary time and change in adiposity, was conducted in six electronic databases (Pubmed, ProQuest, EMBASE, OmniFile Full Text Select, Science Citation Index Expanded, and Cochrane library).

Results:

Of 161 potentially eligible papers, 10 for change in SB and 3 for longitudinal associations with change in adiposity were included, with the majority of them focusing on the western youth population. Weighted mean annual increase in daily sedentary time was 5.7% for boys and 5.8% for girls. The only one study targeting pre-school children showed a decrease in SB. Of the three studies examining changes in SB and adiposity, only one found that increases in sedentary time were associated with increases in adiposity, but only in those with BMI above the 50th percentile. There was consistent evidence that objectively measured SB increases with age, by approximately 30 minutes extra daily sedentary time per year.

Conclusions:

There was little evidence on the influence of changes in objectively measured sedentary time on changes in adiposity. Research into longitudinal trends of SB is warranted for children and adolescents outside the western countries. Furthermore, more studies are needed in order to determine the 'dose-response' associations between changes in sedentary time and changes in adiposity.

P517

Maximizing the detection of youth sedentary behavior with accelerometer data

Authors:

Kelli L Cain, Edith Bonilla, Terry L Conway, Carrie M Geremia, Alexandra Mignano, Jasper Schipperijn, James F Sallis

Purpose:

Accelerometers are commonly used as an objective measure of sedentary behavior, but the method of defining nonwear time directly affects sedentary estimates. The present study examined nonwear definitions and their impact on detection of sedentary time in youth using different ActiGraph models and filters.

Methods:

60 youth (34 children and 26 adolescents; ages 5-17; 54.4% female) were asked to wear a 7164 and a GT3X+ ActiGraph side-by-side on a belt during a 90-minute structured sedentary activity (sitting on a couch watching a movie). Research assistants observed participants to ensure they remained seated. Data from the GT3X+ were downloaded using the normal (N) and LFE extension (LFE). Five nonwear definitions were applied to the 7164, GT3X+N and GT3X+LFE data, and sedentary estimates were computed.

Results:

The 7164 was most sensitive to movement, requiring shorter nonwear definitions to detect 100% of observed sedentary time (i.e., 30 minutes of consecutive zero counts for children and 60 minutes for adolescents) compared to the GT3X+N, which was least sensitive and required longer definitions (i.e., 60 minutes for children and 90 minutes for adolescents). The GT3X+LFE detected 100% of sedentary time with a 60 minute definition for both children and adolescents.

Conclusions:

Different nonwear definitions are needed for children and adolescents, and for different Actigraph models and filters. The recommendation for children is 30 minutes for the 7164 and 60 minutes for the GT3X+N and GT3X+LFE. For adolescents, 60 minutes is recommended for the 7164 and GT3X+LFE and 90 minutes for the GT3X+N.

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Community Interventions Physical Activity & Nutrition

P518

How to perform lifestyle change when there is so much lived life?- A qualitative study of user's expectations in newly established Healthy Living Centers in Norway

Authors:

Ingrid Sørdal Følling, Marit Solbjør, Anne-Sofie Helvik

Purpose:

Norway ranges high in Europe with a good public health, but the prevalence of overweight and lifestyle diseases is increasing. In 2011 The Norwegian Directorate of Health recommended that Healthy Living Centres should be established in all municipalities in Norway with interventions targeting people who need to change their health behavior. This study aimed to explore the factors that influences participants in the beginning and amendment in health behavior in Healthy Living Centers in Norway.

Methods:

Semi-structured qualitative in-depth interviews were performed with a selected sample of 23 participants (16 women and seven men) aged 18 - 70 years. The data were analyzed using Systematic Text Condensation searching for issues describing participants. NVivo 10 and MindMap Manager was used to code and sort the material.

Results:

Participants life baggage with aspects in childhood, family-life, social and work relations, health problems and experience with the health care are important parts of why they are in the situation they are. Their expectations are mainly to be met at an individual level. How to make a lifelong change and get unstuck from the old patterns are based on their earlier life and future wishes about how their life should be.

Conclusions:

The lifestyle issue itself is secondary when it comes to the knowledge about the person itself. It requires additional knowledge that can provide implications for the structure and practice of Healthy Living Centre. More knowledge on succeeders and who is compliant in changing lifestyle in primary health care settings is needed.

P519

What is a health life center?

Authors:

Turid Sundar, Inger Merete Skarpaas

Purpose:

Healthy Life Centers (HLCs) are resource centers which offer effective, knowledge-based programs for people who need support to change their health behavior. HLC programs aim at strengthening the individual's control over his or her own health, and offer services primarily for increased health enhancing physical activity, healthy diet and tobacco cessation. Some HLCs also offer counselling, support and education concerning mental health, sleep, and alcohol problems. Approximately 170 municipalities in Norway have established HLCs and many more are in the process of being established. The centers are part of the primary health care services.

Methods:

The main service offered by HLCs is a structured referral called a "healthy life prescription", to the center's 12 week follow up program. Cooperation with NGOs, private and public organizations, other municipal health care services and local authorities is of vital importance.

Results:

Evaluations have shown that HLCs are recruiting people with low income who do not seek or participate in other services such as fitness centres on their own. Participants at HLCs need help to find appropriate services, build motivation

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to get started and to create strategies for maintaining sustainable behavior change. Medical doctors who refer patients to HLCs report positive experiences with the service. Studies indicate that the programs can lead to improved physical fitness, weight loss and improved self-perceived health, as well as the maintenance of progress one year after the follow-up.

Conclusions:

The Norwegian Directorate of Health has published recommendations for the establishment and management of the HLC.

P520

Use of a mobile motivational interviewing tool to prevent childhood obesity in the pediatric primary care setting: Results from a pilot study

Authors:

Michael Richardson, Monica Wang, Erin McMaster, Lori Pbert

Purpose:

Assess parental accuracy in child weight status identification and examine the feasibility of a mobile motivational interviewing (MI) tool targeting childhood obesity within the pediatric primary care (PPC) setting.

Methods:

The intervention included a 10-minute electronic survey on a mobile device that assessed pediatric dietary and physical activity behaviors, assisted parents in barrier identification for behavior change, and aided with dietary and physical activity goal setting. Participants were parents of children who were patients at a PPC clinic. Parents completed the intervention during the waiting period immediately prior to their child's annual exam. Measures included parental perception of their child's weight status (assessed at baseline), children's weight status (obtained post-intervention via medical records), and parental stage of change (obtained pre- and post-intervention). Multivariable regression models estimated stage improvement associated with parent and child characteristics.

Results:

Participants were parents (N=70) of children ages 6-11 years. Nearly all parents of overweight and obese children underestimated their child's weight status (10% and 0% accuracy, respectively) than parents of healthy weight children (90.4% accuracy; $p < 0.0001$). Most parents (75.1%) were in the pre-contemplative stage pre-intervention; of these participants, 22.6% (N=12) progressed at least one stage post-intervention. Adjusting for covariates, parents with a female child were more likely to progress stage of change (OR=8.9, 95% CI: 1.4-57.1) than parents with a male child.

Conclusions:

Parents of overweight/obese children consistently underestimate their children's weight status. Use of a mobile MI tool demonstrated feasibility within the PPC setting. Tailoring MI strategies by children's gender should be explored.

P521

Changes related to food and health self-care reported after attending a food culture workshop in Mexico City

Authors:

Adina Radosh, Carmen Mena, Ericka Escalante

Purpose:

To inquire about changes reported by attending the "Ser Feliz a través de la Comida" (Be happy through food) workshop in a marginal environment in Mexico City.

Methods:

A quantitative analyses was conducted applying a questionnaire to each participant (most of them women), at base line (n=12) and final (n=10), exploring reported changes related to food and health self-care. The information was complemented with field notes.

Results:

Knowledge, abilities and reflection regarding food and health self-care increased; being community participation ($x=3.7$ vs $x=5.6$) and nutritional knowledge ($x=7.1$ vs $x=9.3$) the most significant ones. The decrease of the perception of self emotional control ($x=7.9$ vs $x=6.1$) may be attributed to the fact that after deep reflection, the need for coping with stressful emotional situations was scoped.

Values as community participation, networking and social responsibility were given an important role on health self-care. The shifting of the importance of food from family related issues (58% vs 30%) to health (42% vs 70%) may highlight the fact that opportunities like this workshop as a time and place to care and nourish one self are needed.

Conclusions:

Dealing with the emotional, social and cultural angles of food is necessary, so individuals and groups can reflect and take action towards health self-care. Developing tools to confront stressful situations, caring for the self, and getting family and social support, is just as needed as knowledge; for self-empowering.

P522

Moving home, shifting lifestyles: Regeneration, relocation and health behaviors in deprived communities

Authors:

Phil Mason, Ade Kearns

Purpose:

Relocation of residents from high-poverty neighbourhoods undergoing restructuring as part of urban regeneration programmes may facilitate positive lifestyle changes. To test this hypothesis, we compared a range of alcohol, diet and physical activity-related health behaviors (HBs) in three resident location groups: Outmovers from restructured neighbourhoods; Remainers, who continue to live in these neighbourhoods; and Nonmovers, who live in deprived areas not undergoing restructuring.

Methods:

Cross-sectional sample of 1338 British adults from 15 areas of Glasgow, UK. Multivariate regression modelling of associations of location group, residential and neighbourhood quality measures, and demographic characteristics with 9 HBs.

Results:

Remainers showed four significantly better HBs than Nonmovers: Frequency of drinking alcohol, fruit and vegetable consumption, neighbourhood walking frequency, and being physically inactive. However, Remainers were less likely than Nonmovers to have reduced their frequency of drinking. Outmovers walked in their neighbourhood more often and were less likely to be physically inactive than Nonmovers. Outmovers were more likely to drink alcohol more frequently than Remainers. Independently, there was at least one positive or negative association between each HB and ratings of the quality of the home, the neighbourhood environment, its services and amenities, and the number of antisocial behaviors and incivilities recognised in the area. Men, those who were retired or not working, and people with a long-term health condition tended to have poorer HBs than their counterparts.

Conclusions:

Relocating from, and remaining in deprived regenerating neighbourhoods may have positive and negative consequences for changes in a range of health behaviors.

E-health

P523

Examining the effectiveness of a text message-based intervention on improving measures of sleep quantity and quality among young adults

Authors:

A. Jordan Filion, Gerarda Darlington, Jean-Philippe Chaput, Michele Ybarra, Jess Haines

Purpose:

To evaluate the effectiveness of a text message-based intervention designed to improve sleep quantity and quality among a national sample of American young adults who were trying to quit smoking.

Methods:

Baseline and 12-week follow-up data were collected from 129 young adults (mean age 21.8 years) who were randomized to receive a 6-week text messaging program focused on either smoking cessation ($n=80$), or improving sleep and physical activity ($n=49$). Sleep quantity was assessed separately for work/school nights, and non-work/non-school nights. Sleep variability was calculated by subtracting quantity on work/school nights from quantity on non-work/non-school nights. Sleep quality was assessed using items adapted from valid and reliable measures. Multiple linear regression was used to test the effect of the sleep intervention on changes in each of the sleep outcome variables.

Results:

Although we observed changes on all sleep outcomes in the desired direction, none were statistically significant. After running separate models for short sleepers (<6 hours/night) and adequate sleepers (≥ 6 hours/night), however, we found that compared to those in the smoking cessation group, short sleepers receiving the sleep intervention were getting significantly more sleep on work/school nights at follow-up ($p<0.05$), adjusting for baseline sleep, change in physical activity level, smoking status at follow-up, daily text messaging usage, sex, education and race.

Conclusions:

This study provides preliminary evidence that a text message-based intervention aimed at improving sleep could be a promising approach for improving sleep habits among young adults, especially those who are short sleepers.

Saturday, May 24, 2014 - 11:15-12:45

Effect of Built Environment on Physical Activity & Nutrition

P524

Influence of food establishments on the development of childhood obesity in a low income urban community in Mexico City

Authors:

Ericka Ileana Escalante Izeta, Adina Radosh, Sylvia Gutiérrez y Vera, Carmen Mena Rangel, Arely Vergara Castañeda

Purpose:

To document the characteristics of food establishments and manager's perceptions about social responsibility in a low-income community in Mexico City.

Methods:

Study based in mixed methods. Non-participant field observation was made by recording the characteristics of food establishments within a radius of twenty miles around the Community House of the Universidad Iberoamericana. Hundred surveys were applied to food establishments investigating the nutritional characteristics of offered food, prices, main buyers and purchasing autonomy in children. Managers were asked about their perception of social responsibility in the generation of childhood obesity. Also 310 school surveys of children's health and anthropometry were applied.

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Results:

37% of children present risk of obesity. The concentration of food sales is on the main street of the town (70%). The most remote places don't have access to cheap and fresh vegetables and fruit. Only have grocery stores that sell cheap processed foods. High-energy food is sold on the street without regularization, all day. The managers attributed the obesity to personal decisions; given less importance to their responsibility about the quality of the products they sell. Financial needs are more important than the community health.

Conclusions:

The quality, quantity and timing of food offered in the community should be exposed to the people, their leaders and decision makers. The reflection on the implications of the offered food, the need to improve the economy of the population and the proper food regulation, will contribute to make structural proposals to help families to make better choices to prevent obesity.

P525

Change in fast-food outlet exposure and cardiometabolic health status of propensity matched 'movers' and 'non-movers' in a biomedical population-based cohort

Authors:

Natasha Howard, Catherine Paquet, Neil Coffee, Graeme Hugo, Peter Lekkas, Anne Taylor, Robert Adams, Mark Daniel

Purpose:

This study sought to investigate the influence of change in area-level exposures through residential re-location on change in cardiometabolic health by 1) matching 'movers' to 'non-movers' with respect to their propensity to re-locate into areas of varying fast-food outlet exposures through drivers of individual mobility, and 2) comparing mover/non-mover matches on their change in cardiometabolic risk.

Methods:

Data were utilised from Wave 1 (n=4041; 2000-03) and 2 (n=3507; 2005-06) of the North West Adelaide Health Study. Cardiometabolic risk factors (lipidemic, glycaemic, blood pressure, and anthropometric measures), and socio-economic/demographic information, were collected from urban-dwelling adults. Quintile changes in movement to areas of higher, lower or similar availability of fast-food outlets were determined. Propensity of movement into higher/lower/similar areas was computed based on individual-level factors (work/income/marital status change, age-cohort, gender, housing tenure) used to match 'movers' to 'non-movers'. Changes in cardiometabolic risk factors between Wave 1-2 were compared across matched mover/non-movers using t-tests.

Results:

Mover/non-mover pairs were determined for higher (n=111), lower (n=129) and similar (n=163) availabilities of fast-food. No significant difference in health status was observed for re-location into areas with similar or lower exposures. Re-location into areas with higher exposure indicated a larger change of cholesterol (-0.04) and diastolic blood pressure (-2.89) compared to non-mover counterparts.

Conclusions:

Using a propensity score approach, this study provided evidence that moving into areas with greater fast-food exposure was associated with increased cardiometabolic risk. Future studies will explore the impact of other environmental exposure changes resulting from re-location.

P526

Too healthy to sell? A qualitative study of food vendors near secondary schools in lower-income areas

Authors:

Michelle Estrade, Smita Dick, Fiona Crawford, Ruth Jepson, Anne Ellaway, Geraldine McNeil

Purpose:

To explore the attitudes and experiences of food vendors near secondary schools in lower-income areas.

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Methods:

Recruitment targeted independently-owned shops near secondary schools in low-income areas of three Scottish cities. Qualitative interviews were conducted with shop owners to explore barriers to offering healthier menu options. Interview transcripts were loaded into NVivo 10 for coding. An inductive qualitative analysis method was used, wherein codes and themes were derived directly from the data, rather than using a pre-constructed framework.

Results:

Interviews were conducted with ten fast food vendors, after which data saturation was reached. Five themes emerged from the interview data: Pride in what is sold; individual autonomy and responsibility; customer demand; profit margin; and neighbourhood context. Interviewees consistently expressed pride in the foods they sold, most of which were homemade. They felt that healthy eating and general wellbeing are the responsibility of the individual and that offering what customers want to eat, not necessarily what they should eat, was the only way to stay in business. Most vendors felt they were struggling to maintain a profit, and that many aspects of the low-income neighbourhood context would make change difficult or impossible.

Conclusions:

Independent fast food shops in low-income areas face many barriers to offering healthier food choices. Interventions and policies that target the food environment in such areas should take the neighbourhood context into consideration. Implementing voluntary guidelines may inadvertently exclude independent food vendors in low-income neighbourhoods from feasible participation, thereby potentially widening the inequality gap.

P527

Food purchasing among low-income, African American adolescents in Baltimore City: What, where, and how often are they buying food?

Authors:

Elizabeth Anderson Steeves, Laura Hopkins, Alessandra Grasso, Kelleigh Eastman, Joel Gittelsohn

Purpose:

Adolescence is a period where youth are gaining autonomy in food-related decision making by increasing food consumption away from home and increasing independent food purchasing. This project will examine the food-purchasing patterns of low-income, urban, African American adolescents, which may be contributing to high obesity rates and poor diet quality.

Methods:

During baseline data collection, the B'More Healthy Communities for Kids study collected information about food purchasing behaviors from 200 youth ages 10-14 via questionnaire.

Results:

59% of the youth were female and 41% were overweight or obese. Youth reported making 7.58+7.89 (M+SD) trips per week to buy food for themselves, and purchased 1.97+1.59 (M+SD) items per trip. Corner stores were the primary location youth purchased food (comprising 41% of total food store visits); they spent an average of \$2.87 per visit to the corner store. Youth spent an average of \$6.00 per visit on food purchases from carry-out or fast food restaurants, which was the second most popular location youth purchased food (22.7%). Sweetened beverages, sweet snacks, and fast food were the most frequently purchased items (mean of 2.43 to 3.28 items in each of these categories purchased per week), while water and fruits/vegetables were only being purchased about once per week.

Conclusions:

Low-income, African American youth frequently purchase food for themselves. The foods they purchase are often high in calories with limited nutritional content. Corner stores and carry-out/fast food restaurants are primary sources of these foods and may be able to serve as potential locations to intervene.

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P528

Childhood obesity and food outlets - the importance of local analysis

Authors:

Claire Griffiths, Paul Gately, Paul Marchant, Adam Taylor, Anna Frearson, Carlton Cooke

Purpose:

Central to improving the prevention and treatment of obesity is to identify the actual role (over the assumed role) of the environment in which people live. Current UK policy in relation to the influence of the 'food environment' is driven largely on assumptions or speculations.

Methods:

Cross sectional study over 3 years (n=13,128 data aggregated together). Children were aged 11 -12 years. Overweight and obesity were defined as having a BMI > 85th and 95th percentiles respectively (UK90 growth charts). Location of food outlets was obtained from the local authority databases. Analysis was completed at the child (i.e. where the child lives) and the school level.

Results:

There was a moderate correlation between deprivation and the number of food outlets (school $r=0.62$ $p<0.05$; child $r=0.17$ $p<0.05$) and distance to the nearest food outlet (school $r=-0.32$ $p<0.05$; child $r=-0.29$ $p<0.05$). There was no association between distance to the nearest food outlet and the probability of being overweight or obese (school OR = 0.99 [0.83 - 1.19]; child OR = 0.84 [0.66 - 1.60], or the number of food outlets within a given boundary (school 2km buffer OR = 1.00 [0.99 - 1.01]; child LSOA, OR = 1.01 [0.99 - 1.03]).

Conclusions:

Absence of food outlets may not be negative however, it does not seem to be protective either. There is no association between childhood obesity and the food environment, suggesting the current policy recommendations may be too simple and will have little impact.

P529

Perceived neighborhood recreation environments and physical activity in adolescents

Authors:

Kavita A. Gavand, Kelli Cain, Terry Conway, Brian Saelens, Lawrence Frank, Jacqueline Kerr, Karen Glanz, James Sallis

Purpose:

To examine relationships between parent perceived neighborhood recreational environment and physical activity (PA) in adolescents. Perceived diversity and proximity of recreation facilities is a core component of activity friendly neighborhood environments which may contribute to youth PA.

Methods:

Participants (N=928, mean age 14.1 ± 1.4 years old, with 50.4% girls, 33.4 non-white/Hispanic) were recruited from the Seattle, WA and Baltimore/Washington DC regions. Moderate-vigorous PA (MVPA) was assessed via 7-day accelerometry. Self-reported PA near home and other recreational locations was assessed. Proximity to home of recreational facilities (8 types in the Neighborhood Environment Walkability Scale for Youth, NEWS-Y) was reported by parents. Mixed model linear regressions adjusted for demographics and neighborhood clustering of participants.

Results:

Having more recreation facilities close to home was related to higher self-reported number of days/week getting 60+ min of PA ($t = 1.98$, $p < 0.05$), PA near home ($t = 3.72$, $p < 0.001$), PA at recreational places ($t = 4.85$, $p < 0.001$), and MVPA ($t = 2.21$ $p < 0.05$). Adolescents living in the lowest quintile of recreation-facility diversity averaged 18.4 ± 4.8 min/day of MVPA versus 46.5 ± 4.6 min/day of MVPA for those living in the highest quintile.

Conclusions:

Adolescents living in neighborhoods perceived by parents to have greater diversity of recreation facilities had higher activity levels across several indicators of PA.

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P530

Beyond the home: Effects of including more than one location on modeled relationships between environment and physical activity

Authors:

Marta Jankowska, Kristin Meseck, Jacqueline Kerr, Jasper Schipperijn, Loki Natarajan

Purpose:

The dominant methodology for assessing the effects of environment on physical activity focuses on the home environment. However physical activity may occur throughout the day in other locations. These environments may play a role in influencing amount of physical activity conducted, and should be considered.

Methods:

Eight studies using GPS and accelerometer devices were pooled together, representing a range of participants and lifestyles. The Personal Activity and Location Measurement System (PALMS) was used to identify locations for each participant's day. Amount of time spent in location was derived from GPS traces, and the top three locations per day were extracted. Ordinary least squares regression compared a single location model to a multi-location model of walkability as a predictor of daily mean physical activity (>100 CPM) controlled for age, wear time, and sex.

Results:

Preliminary results for 41 subjects with 273 days of data show an average of 3.3 locations per day. Average minutes spent in the primary location were 936 ± 404 min. Secondary and tertiary locations had 113 ± 109 min and 37 ± 35 min of time spent respectively. Regression results with participants' primary location indicate that higher walkability had a positive impact on minutes of physical activity (coeff(SE): $2.033(0.384)$, $p < 0.01$). When including three locations, the primary location retained significance ($2.054(.0389)$, $p < 0.01$), however the secondary location was also significant ($1.742(.0187)$, $p < 0.01$).

Conclusions:

Physical activity is occurring in more than the home location, and environmental factors of other locations may be important factors in driving physical activity.

Family - Physical Activity & Nutrition

P531

Family and home environment factors that support healthy eating and active living decrease with age among low-income children

Authors:

Angie Keihner, Patrick Mitchell

Purpose:

To explore differences in family norms and the home environment by age and examine associations with fruit and vegetable (FV) intake, physical activity (PA), and screen time among low-income children in California. Identifying modifiable, age-specific factors related to health behaviors can improve the effectiveness of obesity prevention efforts.

Methods:

A telephone-based, parent proxy/parent-assisted 24-hour recall was used to capture FV intake (Baxter et al., 2009), PA (Welk et al., 2007), screen time and related family/environmental factors for children 6-11 years ($n=651$; 47% response rate). Telephone interviews were conducted in English/Spanish with a random sample of California households receiving CalFresh.

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Results:

Children from homes with family meals ($p < .01$) and FV readily available ($p < .01$) reported eating more FV. Children who exercised with their families spent 24 minutes more on PA daily ($p < .01$). Children with household rules limiting TV time watched 17 minutes less TV daily ($p < .05$). However, as children aged, significantly fewer reported family support, home availability, and household rules. Younger children (6-8 years) were more likely than older children (9-11 years) to report having fruit to eat that they like at home ($p < .01$), fruits kept out where they can get them at home ($p < .001$), eating family meals ($p < .001$), that their family exercises together ($p < .01$), and household rules limiting TV time ($p < .001$).

Conclusions:

Obesity prevention initiatives targeting young low-income children should engage parents in the promotion of family support, home availability, and household rules that support healthy eating, PA, and reduced screen time to prevent declining rates among older children.

P532

Parents reflect on children's food choices: Consuming fruits and vegetables every day trumps variety, and drinking "enough" water is hard to do!

Authors:

Tisa Hill, Laura Thomas, Jamie Dollahite

Purpose:

This research identified topics regarding children's food consumption that parents report as most important and perceived ease or difficulty putting these behaviors into practice.

Methods:

Parents ($n=46$) of children ages 9-13 attended focus groups ($n=7$) in diverse settings and used card sort methodology to categorize food/ beverage choices and related parenting skills by level of importance. Open-ended questions assessed difficulty of putting behaviors into practice, behaviors of greatest concern, and applied parenting strategies.

Results:

Parents identified eating fruits/vegetables every day, drinking enough water, parent role modeling, limiting unhealthy foods at home/school, providing healthy choices at home, and eating lower fat options at school as very important. Parents place less importance on some nutritionally important behaviors including: Trying new vegetables/fruits, drinking milk with meals, not eating chips/cookies for snacks, and eating whole grains. Easiest behaviors were eating fruits as snacks, eating a variety of fruits, drinking milk with meals, respecting food preferences, and engaging children in food purchases; while most challenging behaviors were trying new vegetables, eating variety of vegetables, and drinking enough water. Parents recognized the importance of modeling. For some, providing only healthy options guided choices for both children and parents. A vocal minority reported their top concern as children consuming enough at home and school.

Conclusions:

Results will inform development, cognitive testing, and piloting of messages that reflect parent preferences, nutritional importance of behaviors, feasibility of behaviors, and everyday relevance for parents encouraging and supporting healthier food choices at home and school.

P533

What about dads? Assessing fathers' involvement in child feeding and physical activity

Authors:

Neha Khandpur, Jo Charles, Tim Nelson, Kirsten Davison

Purpose:

Fathers' engagement in child rearing has increased in concordance with increases in maternal employment, yet fathers are rarely included in childhood obesity interventions. To gauge the need to include fathers in future efforts, this

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study quantifies fathers' involvement in food, physical activity and screen-based parenting and examines differences in involvement by educational status.

Methods:

An online, pilot-tested survey, developed through interviews with 20 experts, was distributed through websites, social networking platforms and email. English speaking male adults living in the US who self-identified as the father of a child ≤ 10 years were eligible to participate. Descriptive statistics were used to summarize fathers' involvement. T-tests and Chi-square analysis were used to assess differences in father involvement for low (no college) versus high (college/post graduate) educated fathers.

Results:

Participants (N=352) were primarily biological fathers (96%), married and living with their partner (73%), and from diverse racial/ethnic (61% White, 14.2% African American, 8% Hispanic) and educational (33% no college) backgrounds. 70% of the fathers reported eating with their child. 45% prepared a meal or snack for their child seven or more times a week and the majority (63%) reported grocery shopping 'sometimes' or 'always'. 87% of fathers reported monitoring their child's screen time. Few differences by educational status were identified.

Conclusions:

Fathers reported high involvement in food, physical activity and screen related parenting thus illustrating the importance of including fathers in family interventions for childhood obesity prevention and control. This study was funded by The Harvard Clinical and Translational Science Center.

P534

What about dads? Barriers to engaging fathers in childhood obesity research

Authors:

Jo Charles, Neha Khandpur, Timothy Nelson, Kirsten Davison

Purpose:

Fathers are underrepresented in obesity research. The resulting lack of knowledge on paternal effects on children's diet and physical activity undermines the development of effective family interventions. This study identifies strategies to facilitate fathers' research inclusion.

Methods:

Twenty experts were interviewed about challenges and successes in recruiting fathers. Using this information, an on-line survey assessing fathers' perceived barriers to research participation and recommended venues through which to recruit fathers was developed. The survey was distributed to potential participants through websites, social networking platforms and email. English speaking male adults living in the US who self-identified as fathers with at least one child 10 years or younger were eligible to participate. Differences in reported barriers and strategies were assessed for low (no college) versus high (college or more) educated fathers using chi-square analysis.

Results:

Fathers (N=352) overwhelmingly attributed low paternal involvement in research to "fathers have not been asked" (70%) followed by "fathers are too busy" (29%) and "mothers do not encourage father involvement" (26%). Fathers identified the internet (53%), community sports events (44%) and social support services (39%) as effective places or sources through which to recruit fathers. Low-educated fathers were significantly more likely to report that "fathers have not been asked" and "mothers do not encourage father involvement" and less likely to identify the internet as a good method to recruit fathers than high educated fathers.

Conclusions:

Results from this study can be used to facilitate the future inclusion of fathers in childhood obesity research.

Mental Health & Nutrition/Physical Activity

P535

Mechanisms for facilitated physical activity change in individuals recruited into a depression trial

Authors:

Anne Haase, Kenneth Fox, Adrian Taylor, Melanie Chalder, Glyn Lewis

Purpose:

Individuals with depression can benefit from physical activity (PA), but it is not clear how best to deliver and facilitate support for increasing PA in this population and how psychological factors underpin this supportive environment. This study aimed to determine associations between psychological mechanisms underpinning a depression intervention and physical activity over a year.

Methods:

Patients with diagnosed depression (N=361) were recruited into a randomised controlled trial to receive either physical activity facilitation or usual care. Patients reported self-efficacy, outcome expectations, behavioral regulations and self-report PA at baseline, 4 months, 8 months and 12 months. Linear regression analyses were carried out to predict total PA over time.

Results:

Self-efficacy means in the intervention group were significantly higher ($p < .001$) than in usual care (UC) at 4, 8 and 12 months and mean scores were increasing over time (from 4 to 12 months). Identified and intrinsic regulation means in the intervention group were significantly greater than UC at 4, 8, 12 months. Total and moderate-to-vigorous PA means differed between baseline and 4 months. However, only self-efficacy at 4 months predicted total PA accounting for an additional 14% of variance after adjusting for age, gender, body mass and baseline PA. No other psychological measures predicted total PA at 4 months.

Conclusions:

Although identified and intrinsic regulations were associated with PA at baseline, only self-efficacy predicted change in PA at 4, 8 and 12 months in both arms. Delivery of facilitated PA fostered support and development of PA self-efficacy in patients with depression.

P536

Effectiveness of a Mediterranean-style dietary intervention for improving food intake in people with serious mental illness residing in community rehabilitation centres

Authors:

Dorota Zarnowiecki, Amy Wilson, Svetlana Bogomolova, Andrea Fielder, Nicholas Procter, Kerin O'Dea, Catherine Itsiopoulos, Natalie Parletta

Purpose:

People with serious mental illness (SMI) have 25-30 year higher mortality than the general population due largely to cardiovascular disease. Lifestyle is a major contributor, including poor diet. Mediterranean-style diets, characterised by high consumption of vegetables, fruit, nuts, legumes, olive oil and fish, have been associated with better cardiovascular and mental health. This pilot feasibility study aimed to evaluate the effectiveness of an intervention applying Mediterranean diet principles for improving diet in people with SMI.

Methods:

A 3-month pilot feasibility study was conducted with 20 residents in a Community Rehabilitation Centre in South Australia. Residents received nutrition education, food hampers, cooking workshops, meal planning and shopping support based on Mediterranean diet principles. After one month 13 staff completed an open-ended questionnaire about the intervention protocol. At 3 months, semi-structured interviews were conducted with eight participants, and five staff. Interviews were transcribed and independently coded for key themes by two researchers.

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Results:

In the staff survey 12/13 staff reported observing participants eating more fruit and vegetables, and 9/13 observed participants cooking more. Thematic analysis revealed positive development in (1) eating and purchasing habits for increasing olive oil, fruit and vegetable intake and reducing processed meat intake, (2) cooking skills, (3) social skills, (4) food knowledge, and (5) physical health.

Conclusions:

Preliminary data show that a Mediterranean-style dietary intervention in a community setting is feasible and may improve diet and cooking skills, and therefore cardiometabolic and mental health of people with SMI.

P537

Qualitative meta-analysis of findings from community-based food projects and their impact on mental health and wellbeing

Authors:

Michelle Estrade, Ruth Jepson, Tony Robertson, Roma Robertson

Purpose:

To summarise findings about the evaluation and impact of community food work on mental health and wellbeing.

Methods:

Qualitative meta-analysis was conducted using outcomes reported by Scottish community food projects. Evaluation reports from eight community food projects were analysed. After initial coding, qualitative interviews with key staff were conducted to explore the preliminary themes identified. Eight qualitative interviews were carried out, and transcripts were analysed.

Results:

Two overarching themes emerged: Appropriateness of evaluation tools and the role of social interaction. Quantitative evaluation methods were poorly accepted among participants in the programs, and staff described the need to explore alternative-methods of evaluation. Because outcome evaluation is not often built into the programs, securing the time, expertise, and funding for evaluation is a major barrier. While improved diet quality is generally assumed to be a major mechanistic pathway for mental health improvements in community food program participants, and most evaluation is geared towards detecting such changes, there is little evidence to support this in the meta-analysis. Rather, our analysis suggests that food is being used by community programs as a tool to help people overcome barriers to social interaction and self-confidence, which act as the key pathways to improved mental health outcomes.

Conclusions:

Currently-available evaluation tools fail to capture many important aspects of change in the lives and behaviors of community-based food program participants. This work highlights a key opportunity for community-academic partnerships, through which rigorous alternatives to quantitative questionnaires can be developed for use in community-based mental health work.

Older Adults Physical Activity & Nutrition

P538

Impact of sensory sensitivity on food product liking among elderly people

Authors:

Line Gjertsen, Ida Grini, Marit Rødbotten, Øydis Ueland

Purpose:

Providing acceptable nutrient dense food is crucial to prevent weight loss and malnutrition among the elderly. The aim of this study is to investigate if there is a link between taste sensitivity for basic tastants and liking among elderly people.

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Methods:

75 participants (39 men, 36 women) aged 63 to 89 years were recruited. The respondents were asked to identify three different solutions of salt and sweet. They also measured liking of yoghurt and tomato soup with varying sweetness and saltiness.

Results:

Over 50% of the participants answered correctly on the strongest concentration of sweet, while 26% were not able to correctly identify any of the sweet solutions. Only 15% were able to correctly identify the strongest concentration of salt, while 45% of the participants could not correctly identify any of the salt solutions. Respondents with low sensitivity to sweet preferred the yoghurt with the highest concentration of sugar (44%), whereas of those with high sensitivity only 19% preferred the sweetest yoghurt. There was a general preference for the least salted soups but no correlation between sensitivity to salt and liking.

Conclusions:

These findings indicate that there is a correlation between taste sensitivity for sweet and liking among elderly people. There will be a future health challenge to create products that can increase the food intake among elderly people without a corresponding increase in sugar intake. The consequence of low sensitivity to salt and its impact on food choice needs further study.

Pre/Post-Illness Recovery/Prevention

P539

Physical activity motivation in women with type 2 diabetes and depression

Authors:

Jaclyn Keeney, Kristin Schneider, Sherry Pagoto, Emily Panza

Purpose:

Women with comorbid type 2 diabetes mellitus (T2DM) and depression report low levels of physical activity. This study examined, among inactive women with diabetes and depression: (1) average ratings for physical activity motives and (2) whether age, BMI, and depressive symptoms are associated with physical activity motives.

Methods:

As part of a pilot RCT, participants with T2DM and major depression ($n=29$, 100% female, $M\text{-Age}=53.4$, $M\text{-BMI}=34.6$) completed the Motives for Physical Activities Measure and were administered the Hamilton Rating Scale for Depression at baseline. Descriptive statistics were calculated for the physical activity motive subscales. Multivariate ANOVAs were conducted to examine the influence of age (Median split: 32-54 vs. 55-63-years-old), BMI (lean and overweight vs. obese) and depressive symptoms (mild vs. moderate) on physical activity motives (appearance, fitness, competence, enjoyment and social).

Results:

Appearance ($M=30.17$, $SD=30.167$) and fitness ($M=29.77$, $SD=8.55$) were the highest rated physical activity motives. BMI was significantly associated with physical activity motives [$F(5,20)=4.285$, $p=.008$]. Compared to obese participants, lean and overweight participants reported higher competence [$M=19.95$, $SD=9.29$; $M=34.00$, $SD=6.45$], enjoyment [$M=17.15$, $SD=8.87$; $M=29.33$, $SD=3.50$], and fitness [$M=28.55$, $SD=4.64$; $M=33.00$, $SD=1.26$] motivation for physical activity. Age ($p=.562$) and depression scores ($p=.079$) were not significant.

Conclusions:

Obese, inactive women with diabetes and depression report less physical activity motivation compared to their lean and overweight counterparts. Whether external rewards (e.g., money, discounts, badges) could negate their lower motivation and increase physical activity in obese women with T2DM and depression deserves further study.

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P540

The effect of bariatric surgery on self-reported physical function: A systematic review

Authors:

Louisa Herring, Clare Stevinson, Patrice Carter, Stuart JH Biddle, Christopher Sutton, David Bowrey, Melanie J Davies

Purpose:

The primary objective of this systematic review was to assess pre to post-operative changes in self-reported physical function among obese adults receiving bariatric surgery.

Methods:

We searched six electronic databases (MEDLINE, CINAHL, SCIRUS, Sport Discus, EMBASE, COCHRANE), grey literature sources, reference lists, leading obesity journals, performed citation tracking, and contacted experts in the field. Published and unpublished prospective cohort studies reporting physical function assessed by the Medical Outcomes Study short form (SF-36) before and after bariatric surgery for patients with a body mass index (BMI) $\geq 35\text{kg}\cdot\text{m}^2$ were included; no language or date restrictions were imposed.

Results:

A total of 18 eligible studies were identified with 12 reporting sufficient data for analysis. Pre and 3-6 month post-operative self-reported physical function data were presented in 7 studies all reporting statistically significant mean improvements with large effect sizes (Hedges' g range 0.67 to 2.52). Seven studies reported physical function data 12 months post-surgery; all 7 reporting statistically significant mean improvements and large effect sizes (Hedges' g range 0.89 to 1.94). Both 3-6 and 12 month physical function data were reported for 2 studies, one of which found a greater improvement at 12 months. Mean weight and/or BMI significantly decreased from baseline to both time points in all studies.

Conclusions:

Improvements in self-reported physical function were observed at 3-6 months and at 12 months post bariatric surgery.

P542

STIVI pilot RCT on lifestyle (LS) impact on health outcomes in participants in cancer screening - preliminary results

Authors:

Livia Giordano, Andrea Pezzana, Federica Gallo, Andrea Menardi, Caterina Anatrone, Carlo Senore, Nereo Segnan

Purpose:

Overweight and a sedentary lifestyle are proved to be associated with an increased cancer risk. A cancer screening program can work as an ideal setting to practice healthy LS.

Methods:

Women 50-54 years old attending breast cancer screening and 58 year-old people undergoing colorectal cancer screening are invited to the study. Compliers are randomized (1:1:1:1) into 3 intervention groups [Diet(D), Physical Activity(PA), Physical Activity + Diet(PAD)] and 1 Control(C) group. First step includes biological sampling collection, anthropometry and a self-administered validated LS questionnaire. They receive brochures (LS information). Subjects into intervention groups are invited to 4-lessons courses for counseling and supporting behavioral changes (cooking and physical activity lessons); all participants keep on practicing at home with recipes' books and brochures. Follow-up is at 8 and 12 months.

Results:

771 people (673 women-F, 98 men-M) entered the study and 558 completed the planned intervention protocol: 78% of participants show a high educational level, 54% report a sedentary job, 16% smoke; 50% are overweight or obese; 36% regularly practice PA (49% in the normal weight group, 27% and 18% in overweight and obese). People rating their health as good/excellent are 61.2%, only 6.4% consider having incorrect diet; 90% of participants report a lower than recommended legume intake, 51% F and 61% M a higher meat consumption; further evaluations are in progress.

Conclusions:

Intervention on healthy LS can be useful in reducing/ restraining overweight and obesity. Preliminary data shows that a cancer screening program can be considered a good setting for LS improvement.

Prenatal/Postnatal/Infant/Toddler/Preschool

P543

Attrition in a paediatric weight reduction programme: A qualitative study with children and their caregivers

Authors:

Maartje Willeboordse, Danielle de Vaan, Frans ES Tan, Raesita Hudales, Kim DG van de Kant, Edward Dompeling, Onno CP van Schayck, Anja JSM Krumeich

Purpose:

The treatment programmes for the growing paediatric obesity epidemic are characterized by low effectiveness and high attrition rates. In an 18 month lasting multifactorial randomized trial directed at weight reduction for children with asthma and overweight/obesity (entitled MIKADO), we also experienced low effectiveness and a high attrition rate of 56%. We carried out a qualitative study to investigate the deliberation process of caregivers and children for dis- or continuation of this programme.

Methods:

Semi-structured interviews were conducted with 16 children and 16 caregivers. The grounded theory approach was used. All interviews were transcribed and coded using Nvivo. The expectations and reasons for participation, experiences of the programme and the reasons for (dis)continuation were questioned.

Results:

Overall, participants were positive about the programme components and organisation. Yet, the majority disliked the monotony of the group sessions and found the intense programme difficult to combine with their daily life routines. The prominent themes in the decision to discontinue were the low expectations and lack in sense of purpose participants had prior to the programme. Consequently, participants developed a low motivation to actively engage in the programme.

Conclusions:

This study provides directions for health care professionals and policy makers to reduce attrition and improve effectiveness, such as: Closely monitor purposes of participants and experiment with timing and locations. In addition, several concrete tips to improve participant's motivation are given such as providing health feedback measurements and social bonding activities.

P544

A Pre-post pilot study of Weight4KIDS - A health professional e-learning program for paediatric obesity management

Authors:

Shirley Alexander, Joanne Henderson, Vanessa Shrewsbury, Louise Baur

Purpose:

E-learning is a potentially cost-effective, flexible method for training health professionals in obesity management. Pilot the Weight4KIDS health professional e-learning program for paediatric obesity management to assess its uptake, acceptability and impact on participant learning outcomes.

Methods:

Weight4KIDS is a series of 11 e-learning modules: A core module (basic assessment and initial management) and advanced modules (physical measurements, practical interventions, adolescent obesity, general medical issues, endo-

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crine aspects, orthopaedic issues, nutrition, physical activity, sleep and psychosocial issues). Health professionals from six sites (three non-metropolitan) were invited to complete modules. Participants' knowledge on module topics was assessed at baseline. A post-training survey assessed participants' knowledge, views on module duration/content and intention to improve clinical practice.

Results:

The core module took 20 minutes (median) [IQR: 13 to 37] to complete (n=130; 71% nurses; 55% non-metropolitan). Participation in advanced modules varied (range: n=18 to 70) with median completion times across modules ranging from 2-10 minutes. In all modules there was a statistically significant ($P<0.05$; related-samples Wilcoxon Signed Rank Test) improvement in participants' pre- to post-training knowledge scores. Most participants (range across all modules) indicated module completion: Occurred during work time (58% to 84%), was of appropriate duration (81% to 100%) and detail (83% to 96%), and prompted intention to improve clinical practice (74% to 93%).

Conclusions:

Weight4KIDs improved participants' knowledge of paediatric obesity management and was highly acceptable to a predominately nursing sample. The results support wider rollout of Weight4KIDs. The poor uptake by medical and allied health staff warrants further investigation.

P545

Process evaluation of the physical education (PE) component in the CATCH early childhood program among teachers of preschoolers from low-income populations enrolled in Harris County department of education Head Start

Authors:

Ru-Jye Chuang, Shreela Sharma

Purpose:

Evidence suggests that preschoolers do not spend much time engaging in physical activity, especially moderate-to-vigorous Physical Activity (MVPA), and invest more time in sedentary activities. This study aims to describe the measurement tools and procedures used in the process evaluation of the Physical Education (PE) component of a preschool-based program, CATCH Early Childhood (CEC). CEC included over 500 structured physical activities and equipment aimed at promoting MVPA for preschoolers indoors and outdoors while at school.

Methods:

This was a group randomized controlled study (n=440 preschoolers, 3 intervention and 3 comparison centers) conducted in 2009-2010 school year in Head Start centers in Houston, TX. The process evaluation gathered information from classroom teachers from the 3 intervention centers, and trained program staff during center visits. Descriptive analysis was conducted to present the results from this process evaluation.

Results:

Trained program staff had 46 visits to the three intervention centers during implementation; 46% of which visits observed CEC PE lessons conducted indoors at carpeted area with only a music player needed, 95.6% observed teachers participation in the activities (most or all of the time), 91.3% observed children were often encouraged to be physically active; 88.9% observed half or more of the class was engaged in PA for at least 80% of the time.

Conclusions:

The quality and fidelity of implementing the CEC PE component was evaluated, and the participation of preschoolers and teachers was assessed.

Research/Intervention Tools

P546

The International Fitness Scale (IFIS): Validation and psychometric properties

Authors:

Robinson Ramírez-Vélez, Mayra Nathalie Español-Moya

Purpose:

The International Fitness Scale (IFIS) to assess physical activity levels in the European population (a 5-item version) was created as part of the framework of the EU-funded project HELENA Study “Healthy Lifestyle in Europe by Nutrition in Adolescence”. This paper reports assessment of the questionnaire’s test-retest stability, internal consistency, proportion of agreement and applicability to Colombian young adults.

Methods:

In total 2,340 young Colombian`s completed the IFIS questionnaire. Intraclass correlation coefficients (ICC) and proportion of agreement were computed to assess the stability of the two test scores. Cronbach alpha were calculated to assess the internal consistency of each scale. Proportion of agreement was also calculated to measure the proportion of occasions that individuals gave the same score.

Results:

The reliability scores of the IFIS were excellent (ICC range 0.90-0.96). The Cronbach alpha coefficient is 0.80. The proportion of agreement for all individual items ranged from 77-86%. Mean (\pm SD) time for questionnaire completion during the assessment was 3 minutes 47 seconds (\pm 2 min).

Conclusions:

It appears to have high reliability and reproducibility. The questionnaire is now available to other researchers to investigate its usefulness and applicability across Latin American.

P547

Evaluation of a theory-based intervention aimed at improving coaches’ advice to their athletes regarding sports nutrition

Authors:

Raphaëlle Jacob, Benoît Lamarche, Véronique Provencher, Catherine Laramée, Claude Goulet, Pierre Valois, Vicky Drapeau

Purpose:

To evaluate the effectiveness of an intervention aimed at improving the accuracy of advice on sports nutrition provided by coaches to their athletes.

Methods:

Coaches (n=40) were randomly assigned to a comparison or an intervention group. Both groups attended two 90-minute sessions of a theory-based intervention targeting determinants of coaches’ intention to recommend sports nutrition advice. The intervention group further received an algorithm to help promote informed decision-making on sports nutrition recommendations. Mixed model analysis for repeated measures was used to assess the change in sports nutrition knowledge and intention to recommend nutrition advice over time. GLM analysis and T-tests were used to examine differences between groups in the number and accuracy of nutrition advice provided to athletes over a 2-month period post intervention.

Results:

The theory-based intervention was effective at increasing coaches’ intention to recommend carbohydrates in both groups ($p<0.005$), but this was not maintained after 2-months of follow-up. The increase in sports nutrition knowledge with the intervention was maintained over the 2-month follow-up in the intervention group only (group*time interaction $p=0.04$). Coaches in the intervention group provided more nutrition tips than those in the comparison group (mean

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tips/coach 25.7 and 11.0 respectively, $p=0.009$) during the 2-month post intervention period and those tips were also more accurate (quality score 3.4 ± 0.8 vs. 2.3 ± 1.1 respectively, $p<0.0001$).

Conclusions:

A theory-based intervention increases coaches' sports nutrition knowledge. Addition of a decision-making algorithm was more effective in maintaining knowledge over time and in having coaches recommending more accurate sports nutrition advice to athletes.

P548

Are newer versions of ActiGraph accelerometers (GT3X+) comparable with older models (7164) in young people, and does the low frequency extension make a difference?

Authors:

Edith Bonilla, Kelli Cain, Terry Conway, James Sallis, Alexandra Mignano

Purpose:

Data comparability is an important question in longitudinal studies using different models of accelerometers to measure physical activity. Although studies have been done with adults to compare 7164 and GT3X+ Actigraph accelerometers, comparability in youth has not been demonstrated. The purpose of this study was to determine whether the 7164 is comparable with the GT3X+ using the normal (N) and low frequency extension (LFE).

Methods:

57 youth (54.4% female) between ages 5-17 years ($M=10.66$; $SD=3.7$) wore a 7164 and a GT3X+ accelerometer simultaneously for three consecutive days. Accelerometers were side-by-side, attached to a belt, and collected data in 30-second epochs. GT3X+ were downloaded using normal and LFE extension. Average daily step counts and minutes per day in nonwear, sedentary, light, moderate, vigorous, and MPVA were calculated.

Results:

Means for 7164 and GT3X+N were significantly different for all 7 comparisons ($p<.05$). Largest differences were in sedentary and light activity, with GT3X+N showing more sedentary and less light than the 7164 (+17.9 and -19.4 min/day, respectively). The GT3X+N also recorded 9.1 fewer MVPA min/day and 2721 fewer steps per day. Applying LFE to GT3X reduced differences in light and sedentary to about 10 min/day ($p=0.14$ and $p=0.00$, respectively) and in MVPA to 5.5 min/day ($p=0.00$). However, LFE recorded 5273 more steps per day compared to the 7164.

Conclusions:

To reduce the differences found between old and new generations of ActiGraph, studies should employ the LFE for more comparable results. Comparing step counts across models and filters should be done with caution.

P549

Validity and reliability of translated questionnaires measuring physical activity enjoyment and social support among Hong Kong Chinese children

Authors:

Yan Liang, Patrick Lau

Purpose:

To access the validity and reliability of translated scales to measure physical activity (PA) enjoyment, and social support for PA in Hong Kong Chinese children.

Methods:

273 participants aged 8-12 years volunteered to participate in this study. Confirmatory factor analysis (CFA) was conducted to assess factorial validity for each scale. After deleting items when necessary based on item analyses and CFA, criterion validity was assessed by correlating measured PA correlates with self-reported PA. Cronbach's alpha was calculated to assess internal consistency of the scales. Intraclass coefficient correlation (ICC) was performed to assess test-retest reliability for each scale.

Results:

After some modifications, the CFA results supported the one factor structure of the tested scales. All PA correlates were significantly ($p < 0.01$) associated with self-reported PA (r ranged 0.24-0.40). All the scales suggested acceptable internal reliability. All ICC values of the scales suggested acceptable test-retest reliability.

Conclusions:

This study provided psychometric support for using the tested scales to measure PA enjoyment and social support for PA in Hong Kong Chinese children.

P550

Demonstrating the utility of a person-worn camera to assess multiple behaviors in different populations: Beyond accelerometers and food recalls

Authors:

David Wing, Suneeta Godbole, Lu Wang, Eileen Johnson, Jacqueline Kerr

Purpose:

To provide objective measures of physical activity (PA) and eating behaviors (EB) using a single device. Person-worn cameras (PWC) offer the opportunity to classify and characterize multiple concurrent activities and their contexts, simultaneously; allowing for the objective classification of contextual and time-specific activities.

Methods:

Two distinct populations, overweight females (OF $n=197$ person-days) and university employees commuting via bicycle (CB $n=90$ person-days), wore a PWC for a minimum of 8 hours a day for 3-5 days along with a hip worn accelerometer. PWC images were annotated for position (e.g. sedentary, or walking/running) and activities (e.g. eating, TV watching, etc) using standardized procedures.

Results:

Results are presented to demonstrate the utility of PWC images to objectively identify behaviors in different populations.

- OF showed no difference in sitting time between weekdays and weekends, compared to a 10% difference in CB group.
- Time spent cycling was double on weekdays vs weekends in the CB group (8.2% vs 4.3%) while accelerometry did not detect differences in activity level.
- Both the OF and CB group performed more household activity on weekends vs weekdays (10% and 14% respectively).
- In the CB group, 13% of eating time was in front of a TV/screen on weekends
- OF evidenced stable car use on weekdays vs. weekends while the CB group varied by as much as 9%.

Conclusions:

This study demonstrates how a PWC can assess multiple behaviors concurrently, which may be useful in better understanding the context and timing of specific behaviors.

P551

Predicting energy expenditure from a wrist-worn ActiGraph GT3X+ accelerometer

Authors:

Suneeta Godbole, Lu Wang, Gina Merchant, David Wing, Simon Marshall, Jacqueline Kerr

Purpose:

To examine the validity of a wrist-worn accelerometer for predicting energy expenditure in adults.

Methods:

Thirty-eight adults (Age: 35.7 ± 12.2 ; 54% male) participated in up to 6 prescribed activities of daily living (e.g. washing dishes, sweeping), and walking (slow and brisk), while wearing an ActiGraph GT3X+ accelerometer on the non-dominant wrist. Concurrent assessment of oxygen consumption was performed using a Cosmed K4b indirect calorimeter.

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Each activity was performed for 6 minutes and minutes 3-5 were used in the analysis to represent steady-state activity. METS were predicted by the three movement planes and vector magnitude (VM) in counts per minute using linear mixed-effects models. A 10-fold cross validation technique was used to calculate the error rate. Activity intensity classification in the predicted model was compared to classification using Freedson-1998, Freedson-VM and Troiano-2008 hip-based cut points on wrist-worn data.

Results:

The final prediction model used the vertical axis (A1) and anterior-posterior axis (A3) ($rMSE = 1.63$, $Bias = -0.31$) defining the equation as: $METS = e^{((1.2514 + 0.000050 \cdot A1 - 0.000031 \cdot A3))}$. The predicted model has a sensitivity of 59.8% and a specificity of 59.1% for activity intensity classification and outperformed hip-cut-point-based activity intensity classification.

Conclusions:

A wrist-based accelerometer has a low sensitivity and specificity for activity intensity classification. However, when hip-based cut-points are used to classify activity intensity from a wrist-worn device, validity is even poorer. Due to the complexity of arm movement during daily living activities, it may be beneficial to use machine learning to improve classification accuracy.

P552

Interviewer impressions regarding use of the International Physical Activity Questionnaire (IPAQ) to assess physical activity among low-income adults

Authors:

Het Desai, Debra Palmer

Purpose:

To assess interviewer impressions of using the International Physical Activity Questionnaire (IPAQ) to Assess Physical Activity Among Low-Income Adults.

Methods:

Semi-structured interviews were conducted with a research team ($N=30$) who had used the IPAQ to assess the physical activity levels of a sample of low-income adults ($n=1123$) pre- and post- a physical activity intervention that was conducted between January and July 2013. Interviewers were either emailed ($n=13$) or interviewed in person ($n=10$). A single question was posed. (i.e., What were your experiences and thoughts regarding use of the IPAQ long form in the study in which you recently conducted interviews?) Results were catalogued and sorted to reveal emergent themes. Responses pertinent to each theme were quantified.

Results:

Of the interview 30 staff contacted, 17 responded. Twelve thought the questionnaire was too lengthy. Eleven thought the language used was not suited for the target population. Eight thought certain terms, like “moderate” and “vigorous”, needed further clarification or to be better defined. Seven thought the participants underestimated the time spent performing activities, (e.g., time spent walking or sitting in a day), while six thought it was often overestimated, thereby calling the validity of the data into question. Five thought some of the questions were redundant or irrelevant. No positive comments regarding the survey instrument were made.

Conclusions:

These findings suggest the use of IPAQ to assess activity among a low-income population may not be an appropriate tool.

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P553

To lie or not to lie? A comparison of self-report and objective data in a web-based intervention

Authors:

Shayna Fairbairn, Kerry Mummery, Cally Jennings

Purpose:

Web-based interventions often involve self-monitoring of activity. Even with the addition of objective devices the self-monitoring aspect leads to the possibility of incorrect reporting on a website (either intentional or unintentional). In this study participants were given a monitoring device which synced to a background website only accessible by the researchers; researchers were able to compare the objective data with the data that participants recorded on the website.

Methods:

Data from fifty participants of a larger study was analyzed to determine the extent to which the data from the objective monitoring devices (the Fitbit One) differed from the data they recorded onto the challenge website (www.UWALK.ca). Participants were instructed to record the number of flights of stairs displayed on the monitoring device onto the website each day. A repeated measures MANOVA was conducted to determine if there was a difference between self-report and objective data.

Results:

The results of this study showed that there was a strong relationship between the flights of stairs that were recorded by the monitoring device and the activity that participants recorded on the website. The results of the repeated measures MANOVA showed the difference between self-report and objective data to be non-significant ($p = .633$).

Conclusions:

The results of this study are a positive affirmation that the combination of an objective measure and self-report data can still be accurate. These findings are encouraging to research that relies on self-monitoring with the use of objective devices such as pedometers or commercial physical activity monitors.

P554

Examining the use of a 3-minute submaximal step-test to predict cardiometabolic risk in a sample of Latina women

Authors:

Marisa Molina, Jeanne F. Nichols, Guadalupe X. Ayala

Purpose:

Numerous studies have found that heart rate recovery (HRR) following maximal exercise testing predicts mortality regardless of cardiovascular health status or exercise capacity. However practitioners rarely assess patients' aerobic fitness because of limitations in time, equipment, and technical expertise. Alternative measures of aerobic fitness that are easy and inexpensive to administer are needed. This study examined the association of HRR from a 3-minute step-test and cardiometabolic (CM) risk in Latina women participating in a physical activity (PA) intervention.

Methods:

Participants were 442 Latina women between 18 and 69 years, who were interviewed and evaluated including height, weight, waist circumference, blood pressure and a 3-minute submaximal step-test (10" step height) at community locations by research assistants. HRR was measured by a HR monitor immediately post-test and at 60-seconds during recovery. Logistic regression was used to measure the association between cardiometabolic risk factors and HRR.

Results:

Of the 442 women in this study, 389 (88%) were able to complete the step-test. Analysis from these women suggest that HRR was significantly associated with diagnoses of diabetes ($OR=.960$, $p<.024$) and high cholesterol ($OR=0.974$, $p<.031$), having an at-risk waist circumference (>88 cm) ($OR =0.967$, $p<.007$), and being obese (≥ 30) ($OR=0.963$, $p<.004$).

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Conclusions:

Study findings suggest that HRR following a standardized step-test may be a valid measure of cardiometabolic risk. Further, step-tests are easily administered in community settings, and do not require expensive equipment, medical supervision, or technical expertise. Further research should explore the use of this measure to determine risk status by practitioners.

P555

Comparing two screening tools to identify older adults at risk of type 2 diabetes: Results from the Alberta older adults health survey (ALERT)

Authors:

Lorian Taylor, Dean Eurich, Steve Johnson, Paul Gardiner, Jeff Vallance

Purpose:

The objectives of this study were to a) identify diabetes risk scores of older adults in a population-based sample using two validated risk screening tools and b) compare differences in scores across the two screening tools.

Methods:

The ALERT study was a large population-based study of older adults (>55 years of age) in Alberta, Canada. Participants (N=690) answered items from the Finnish Diabetes Risk Screen (FINDRISC) and the Canadian Diabetes Risk Assessment Questionnaire (CANRISK) using computer assisted telephone interviews. Both tools score age, body mass index, waist circumference, physical activity, fruit and vegetable consumption, high blood pressure, high blood sugar, and family history of diabetes. The CANRISK also scores gender, ethnicity, macrosomia and education.

Results:

The FINDRISC classified 17.1% of participants as low risk, 40.3% as slightly elevated risk, 21.0% as moderate risk, 20.4% as high risk, and 1.2% as very high risk. The CANRISK classified 18.1% of participants as low risk, 52.0% as moderate risk and 29.9% as high risk. The CANRISK classified 84 people as high risk who were classified as slightly elevated (n=25) or moderate (n=50) risk by the FINDRISC. The FINDRISC classified 27 people as high risk who scored at moderate risk by the CANRISK. Group classification was significantly different between the two screening tools [$\chi^2 = 465.5(8)$, $p < 0.001$].

Conclusions:

In this randomly selected population-based sample the CANRISK identified more people at high risk of diabetes. The increased ability of the CANRISK to identify adults at high risk of diabetes may have important clinical implications.

P556

Utility of telephone survey methods in population-based health studies of older adults: An example from the Alberta older adult health behavior (ALERT) study

Authors:

Lorian Taylor, Steven Johnson, Dean Eurich, Paul Gardiner, Gillian Stevens, Jeff Vallance

Purpose:

The primary objective of this study was to describe the utility of using random-digit dialing and Computer Assisted Telephone Interviewing (CATI) for sampling, recruitment and data collection in a large population-based study of older adults [Alberta Older Adult Health Behavior (ALERT) study].

Methods:

Using random digit dialing, older adults (≥ 55 years) completed health behavior and outcome measures via CATI in Alberta, Canada. After completing the CATI, participants were invited to receive a step pedometer and waist circumference tape measure via mail to gather objectively derived ambulatory activity (via step pedometer over three days) and waist circumference assessments.

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Results:

Overall, 36,000 telephone numbers were called and 7,013 were eligible for the study. Of those, 4,913 (70.1%) refused to participate. A total of 1,296 subjects completed telephone interviews (18.5% of those eligible and 3.6% of all subjects approached). Average age of participants was 66.5 years, and 43% were male. A total of 1,081 subjects (85%) also submitted self-measured step pedometer and waist circumference data. With the exception of income (18.7%), the rate of missing data for demographics, health behaviors, and health measures was low (<1%).

Conclusions:

Older adults are willing to participate in telephone-based health surveys when randomly contacted. The utility of this type of study is high when a large population of subjects is available for sampling; however, utility in smaller populations is less certain given the overall low yield per call. Researchers can use the information to evaluate the feasibility and logistics of studies using a similar study design.

P557

Can we accurately assess where people eat: Validity of GPS and GIS to locate eating behaviors

Authors:

Brittany Lewars, Kristin Meseck, Suneeta Godbole, Jacqueline Kerr, Marta Jankowska, Eileen Johnson

Purpose:

GPS devices have been used to assess physical activity locations but it is unclear if they can determine eating locations. Even if the GPS geolocates an individual in a commercial location, it is unknown if GIS food environment data accurately match that location as a food outlet. This study used images from person-worn cameras to validate food locations and assess the accuracy of GPS/GIS food locations.

Methods:

GPS and SenseCam devices were worn by 77 individuals from two diverse cohorts. SenseCam images were coded for restaurant eating episodes. County data on all food retail outlets were geocoded using ArcGIS Online and Google API geocoders. The first GPS fix of the eating episode and a mean of all points during the eating episode were used to calculate distances from the nearest food retail location within a 10 m., 20 m., and 50 m. buffer.

Results:

81 eating locations were geolocated and matched with GIS data. The sensitivity of correctly locating the food outlet compared to the camera images was < 60% for all distances. Google geocoder achieved the highest sensitivity with a 50 meter buffer using the first GPS fix (58%). This performance was significantly better ($p < .001$) than other methods.

Conclusions:

The Google geocoder and first GPS fix performed the best. This indicates that correctly locating individuals in food locations with GPS and GIS is still problematic. Understanding how much error is GPS vs GIS based is important. Further, person-worn cameras may be a useful tool to assess food locations.

P558

Free-living accelerometer-determined time spent at or above individualized normal cadence in children by BMI-defined weight status

Authors:

Catrine Tudor-Locke, John Schuna, Melinda Solomon, Brigitta Baker, William Johnson

Purpose:

The study of children's free-living cadence (steps/min) is possible using accelerometers capable of recording minute-by-minute step data monitored over several days. The objective of this study was to determine free-living accelerometer-determined time at or above GAITrite-assessed individualized normal cadence in children categorized by BMI as

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normal weight, overweight, and obese.

Methods:

A total of 375 children (154 boys, 221 girls; age=9.9±0.6 years; BMI=19.1±3.9 kg/m²) participating in the Baton Rouge site of the International Study of Childhood Obesity Lifestyle and Environment (ISCOLE) provided GAITRite-determined normal walking cadence and wore ActiGraph accelerometers for one week. Descriptive data included sample percent categorized as normal weight, overweight, and obese. A mixed-model ANOVA (PROC MIXED) was used to evaluate differences in GAITRite normal cadence and accelerometer-determined time above this individualized threshold between categories of BMI.

Results:

66.4% were normal weight, 16.0% were overweight, and 17.6% were obese. Children crossed the GAITRite at ($M \pm SE$) 112.8 ± 0.9 steps/min during their normal walk (114.0 ± 1.2, 112.0 ± 1.9, and 111.0 ± 1.8 steps/min, respectively by the three BMI-defined weight categories; $p=0.35$). On average, 2.4±0.2 min/day was spent above individualized normal cadences (2.7 ± 0.3, 2.5 ± 0.5, and 1.5 ± 0.5 min/day, respectively by the three BMI-defined weight categories; $p=0.18$).

Conclusions:

There was no BMI-related difference in free-living time ambulating at or above individualized walking cadence in part because all children homogeneously spent very little time (on average < 3 min/day) at such cadences.

P559

Use of wearable cameras to examine misreporting during 24h dietary recalls

Authors:

Luke Gemming, Aiden Doherty, Jennifer Utter, Cliona Ni Mhurchu

Purpose:

Quantify alterations to self-reported dietary intake using a wearable camera to examine misreporting in the 24h dietary recall.

Methods:

Forty New Zealand adults wore an automated wearable camera (SenseCam) for three non-consecutive days in free-living conditions over a 14 day period. Dietary intake was assessed using three multiple-pass 24h dietary recalls. Captured images were viewed after the dietary recalls were completed and changes to self-reported intakes were recorded. Unreported foods, misreported foods and changes to portion size were grouped into eight food categories: Breads/cereals; beverages; fruit/vegetables; snack foods; meat/fish; dairy; condiments; and others. Eating episode, time, food category and impact on energy content (EI) from the alterations were summarised.

Results:

Across the 120 dietary recalls conducted participants (31±10 yrs, BMI 25±4 kg/m²) identified 265 unreported foods, 36 misreporting foods, and 51 changes to portion size which represented 110 570 KJ, -16 852 KJ, and 13 628 KJ respectively. Snack foods (n=65, 36 547 KJ), condiments (n=50, 15 343 KJ), and beverages (n=40, 12334 KJ) were most frequently under-reported. The majority of unreported snacks (81%) and beverages (65%) were consumed between main meals, while condiments (74%) were during main meals. Fruit and vegetables were frequently unreported (n=45) but had little impact on total EI (7187 KJ).

Conclusions:

Wearable cameras provide an objective record of dietary intake and can reduce misreporting errors. Unreported energy dense snack foods and other misreporting errors are common during dietary recalls.

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School Environment: Effects/Interventions

P560

Nutritional comparison of packed and school lunches following the implementation of the 2012-2013 national school lunch program standards

Authors:

Alisha Farris, Sarah Misyak, Kiyah Duffey, George Davis, Naama Atzaba-Poria, Kathy Hosig, Mary McFerren, Elena Serano

Purpose:

Approximately 40% of children bring a packed lunch to school in the United States each day. Little is known about the quality of packed lunches. While new nutrition standards have been implemented for the National School Lunch Program (NSLP), packed lunches are not required to meet any standards. This study examined the nutritional quality of packed lunches compared to school lunches, following the implementation of the new NSLP standards.

Methods:

Observational data for packed and school lunches were collected from pre-kindergarten and kindergarten children from three elementary schools in a rural region of the United States for five consecutive school days and analyzed for food group and macro-and-micro-nutrients using Mann-Whitney-Wilcoxon tests and descriptive statistics.

Results:

Of the 1314 observations collected; 42.8% were packed lunches (n = 562), and 57.2% school lunches (n = 752). Energy, fat, saturated fat, sugar, vitamin C, and iron were significantly higher for packed lunches, while protein, sodium, fiber, vitamin A and calcium were significantly lower. Packed lunches contained fewer fruits, vegetables, juice without added sugar, and milk while containing more savory snacks, sugar-sweetened juice, and desserts.

Conclusions:

Eating habits developed in early childhood continue into adolescence and adulthood. Additional research is needed to explore factors related to why parents and children may choose packed lunches over NSLP participation. Education programs targeting children and parents and school policy should be encouraged to promote healthier options within packed lunches and/or participation and increased enrollment in NSLP.

P561

Smarter lunchroom makeovers: An iterative process evaluation

Authors:

Laura Thomas, Tisa Hill, David Just, Brian Wansink, Jamie Dollahite

Purpose:

This process evaluation sought to determine barriers and facilitators that influence process fidelity when delivering a school lunchroom-based intervention. In addition, the training and support needs of community agencies focused on health promotion and cafeteria staff were examined.

Methods:

(Intervention) Smarter Lunchroom Makeovers (SLM) were implemented in cafeterias of 17 schools in New York in either a rural (R) or urban (U) county. Assisted by community partners (interventionists), school food service directors and cafeteria managers (providers) implemented low or no cost changes in lunchrooms to encourage healthful choices under the guidance of a research team. Outcome measures included plate waste and food production records. Process measures included training progression records and evaluations, weekly contact logs, and semi-structured interviews with interventionists and providers. In addition, implementation strategies were evaluated for degree of treatment fidelity.

Results:

Providers reported that treatments were acceptable and feasible to implement, however notable differences in moti-

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vation existed among schools. Interventionists discussed strategies to enhance provider buy-in, including reformulating training and providing training certificates. Providers also stressed the importance of having a longer recruitment period, as well as some additional campus-level support. Evaluation of implementation strategies revealed that there were deficiencies in key recommendations, such as over-recruiting providers.

Conclusions:

The results of this process evaluation are valuable for those considering implementing SLM in schools, particularly as the focus of community-based organizations are shifting towards making sustainable environmental changes for obesity prevention. These findings will also help inform the process of a SLM randomised controlled trial.

P562

Socially constructed obesity and overweight in marginalized schools of Mexico City

Authors:

Bernardo Turnbull, Ericka Escalante Izeta, Marco Aurelio González Unzaga, Gloria Oliva Martínez Andrade

Purpose:

Poverty and lack of resources do not protect children against obesity and overweight and the prevalence in Mexico is high and still growing among poor and marginalized children. Many interventions, preventive and corrective, fail because they ignore or misunderstand the influence of behavior and environmental influences on nutrition and physical activity. Our aim was to inform further interventions by finding out how obesity is socially constructed in these circumstances.

Methods:

We interviewed 20 obese and 20 overweight children, 20 normal weight children all between 3rd and 6th grade, from three schools in a marginalized area of Mexico City. When available, we interviewed their mothers. Finally we interviewed classroom and physical education teachers who volunteered to cooperate. The research team kept field diaries containing observations of the school functioning and the neighborhood.

Results:

The nutrition system of the children is very complex and most families are almost completely unaware of it. Nutrition and physical activity are the products of reaction and immediate adaptation; conscious decisions and planning are scarce, misinformed and disconnected. Taste and impulse rule over other motives and guidelines and the result is gross energy unbalance. The children decide more and more each day about the contents and quantity of their foods and their physical activities. Adults are still officially responsible but they purchase, prepare and serve food to please the children.

Conclusions:

We suggest interventions that empower the children to grow into active and responsible agents of their own health against an unhealthy environment.

P563

The Dutch healthy day-school of the future: Design and rationale of an innovative concept

Authors:

Maartje Willeboordse, Maria Jansen, Renate H de Groot, Andrew HA Simons, Onno CP van Schayck

Purpose:

The current prevention strategies for unhealthy lifestyles in school-aged children are characterized by low efficiency and high attrition rates. Besides, interventions often do not reach the high-need target population of low socioeconomic families. To counteract these unhealthy lifestyles, we developed an innovative day-school concept. The day-school concept consists of an additional sport and play program for 2 hours/day for 5 days/school week, including health education and breakfast, lunch and healthy snacks. The aim of this project is to study the effects of the innovative day-school concept on physical and mental health, cognition and academic achievements, and to study its cost-effectiveness and the legal aspects.

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Methods:

In a longitudinal quasi-experimental, prospective study, four primary intervention schools (n=1200 pupils) situated in the Southern part of the Netherlands will be compared to an equal amount of pupils in control schools in the same region. Data collection will be routinized within the school (care) system. Outcome indicators include activity monitors, questionnaires, cognitive tests and information from existing scholarly achievement datasets.

Results:

The baseline measurements will start in September 2014. A day-school arrangement is a new concept in the Netherlands. Due to its innovativeness, multifaceted approach, and strong scientific foundation this integrated program has the potential to be a great example for other schools worldwide. It may affect not only health and scholarly achievements, but also cultural aspects of our society i.e., norms and values about parenting, education and labour input.

P564

Food, Health & Choices (FHC): Are we underpowering school-based nutrition intervention studies? Investigating Intraclass Correlation Coefficients (ICC) in a cluster-randomized trial of a school-based obesity prevention intervention

Authors:

Heewon Lee, Marissa Burgermaster, Elizabeth Tipton, Isobel Contento, Pamela Koch, Jennifer Di Noia, Ana Islas

Purpose:

Schools are often the unit of randomization in school-based nutrition interventions. Therefore, sample size and statistical power calculation should consider clustering effects. The current study investigates how student outcomes are clustered within schools.

Methods:

A cross-sectional study. ICCs were calculated as school variance over total variance (sum of the within-school and between-school variances) for the primary endpoint, BMI z-score and % Body Fat (%BF), and for energy balance-related behaviors. Participants were students aged 9-13 years and enrolled in 20 New York City public schools. BMI z-score was calculated based on measures of height and weight, and %BF (n=958) was measured with a Tanita® body composition analyzer (Model SC-331s). Frequency of energy balance-related behaviors were self-reported with a questionnaire (n=939). Using SPSS software v.21, Wald test was performed to see if within-school variances are significantly large.

Results:

Variances within school level for BMI z-score and %BF were significantly large with ICC 0.04 for BMI z-score and 0.05 for %BF ($p < 0.05$). For energy balance-related behaviors, ICC for each frequency scale are: Fruit and vegetable (0.02), physical activity (0.02), screen time (0.07), sweetened beverages (0.11), processed packaged snacks (0.10), and fast food (0.07) (all $p < 0.05$).

Conclusions:

The large ICC scores in BMI-z and %BF, and behavioral outcomes indicate strong clustering within schools that would make it difficult finding treatment differences. Appropriate ICC estimates are needed for studies to be powered to detect outcomes, if the intervention is effective. These results may aid sample size estimation for future school-based cluster randomized controlled trials.

P565

Academic outcomes are better among girls with higher cardiorespiratory fitness, independent of weight- and socioeconomic status

Authors:

Carla Santana, Liane Azevedo, Thrudur Gunnarsdottir, Edna Prado, Breno Farah, Wagner Prado

Purpose:

To explore the association between weight status, cardiorespiratory fitness, and academic performance among youth

aged 10-13 years in Recife, Brazil.

Methods:

Participants included three hundred and ninety-two 5th and 6th grade students (age range: 10-13 years). Students' heights and weights were measured and they were classified according to their BMI percentile into normal weight or overweight/obese categories (underweight students were not included in this study). Cardiorespiratory fitness was estimated by a 20-meter shuttle run test, and Math and Portuguese tests were administered to the students at school (scored from 0 to 10). Multiple linear regression analyses were conducted to examine the association between weight status, academic performance (Portuguese, Math and overall average academic performance) and cardiorespiratory fitness, when adjusted for participants' socioeconomic status.

Results:

The results indicated that among girls (n=193), independent of socioeconomic- and weight status (normal or overweight/obese), higher cardiorespiratory fitness was significantly associated with better academic achievement in math ($B(SE)=0.128(0.043)$; $B_{standardized}=0.217$; $F=3.846$; $p=0.001$; $r=0.240$; $r^2=0.058$), Portuguese ($B(SE)=0.123(0.042)$; $B_{standardized}=0.189$; $F=3.266$; $p=0.002$; $r=0.222$; $r^2=0.049$) and overall average academic performance ($B(SE)=0.126(0.036)$; $B_{standardized}=0.251$; $F=4.860$; $p<0.001$; $r=0.268$; $r^2=0.072$). However, no association was found between weight status, academic achievement and cardiorespiratory fitness among boys, when adjusted for socioeconomic status.

Conclusions:

Among Brazilian girls in the age range of 10-13, cardiorespiratory fitness is positively associated with academic performance, when adjusted for BMI and socioeconomic status. The results indicate the importance of keeping girls active throughout a developmental period commonly associated with reductions in girls' levels of physical activity.

P566

An intervention program improved food consumption in students attending public elementary schools in Sonora Mexico

Authors:

Trinidad Quizan-Plata, Claudia Anaya-Barragan, Julian Esparza-Romero, Armida Espinoza-Lopez, Maria Esther Orozco-Garcia, Adriana Veronica Bolaños-Villar

Purpose:

The aim of this study was to evaluate the effect of an intervention program in children attending public basic school in Sonora, Mexico. Six schools were randomly allocated to either intervention or control program.

Methods:

The intervention program consisted of six sections: a) Educational workshops that included videos with cartoon characters, b) billboards focused on eating healthy foods, c) availability of healthy foods in school stores, d) award by eating healthy foods, e) nursery song "las verduras" and f) brochure with weekly healthy food menu available at school store. We applied 24-hour recalls, food inventory and sociodemographic questionnaires pre- and post-intervention in order to evaluate changes in both groups. Logistic regression and independent t-tests were applied.

Results:

The availability of healthy foods in school stores increased after the intervention ($p \leq 0.05$). The fruits and vegetables were ranked at first place of consumption during recess after the intervention ($P=0.004$). Students in schools where the program was not applied increased the risk of consuming unhealthy foods during recess (OR, 95% CI, 3.7, 1.7-7.8, $p<0.001$). Macronutrient intake was lower in the intervention program students ($p\leq 0.05$).

Conclusions:

Results suggest that continuous promotion of healthy habits in students can prevent health risks. Supported by Consejo Nacional de Ciencia y Tecnología (CONACYT).

Young Adult/College Physical Activity & Nutrition

P567

Muscular strength is inversely related to Body Adiposity Index (BAI) in young individuals

Authors:

Robinson Ramírez-Vélez, Jorge Enrique Correa, Katherine González-Ruiz

Purpose:

Inverse associations with muscular fitness and prevalence of obesity have previously been reported in cross sectional studies. However, this association has not been reported in Latin-American populations. The aim was to study the correlation between muscular strength with Body Adiposity Index (BAI) in young individuals.

Methods:

2,374 young men (age 23.3 ± 2.3 years; weight 61.2 ± 11.3 kg; BMI 22.5 ± 3.6 kg•m⁻¹; BAI 20.1 ± 3.3) were invited to participate in the study. All subjects were from Bogota (Colombia) and belong to different universities (public and private). They had no indication of cardiometabolic problems, as evaluated by interview. Muscular strength was measured by isometric handgrip (dynamometer). Weight and height were determined according to the recommendations (ISAK). BMI was calculated as weight (kg) divided by height (m) squared (kg•m⁻¹). The BAI was calculated using the equation suggested by Bergman and colleagues, $BAI = ((\text{hip circumference}) / ((\text{height})^{1.5}) - 18)$. The existence of significant bivariate correlations among parameters such as BMI, BAI and weight was ascertained by means of determining Pearson correlation coefficients.

Results:

Muscular strength and weight showed a moderated correlation ($r = 0.472$, $p = 0.001$). A lower correlation was found between muscular strength and BMI ($r = 0.130$, $p = 0.001$). Furthermore, there was an inverse correlation between BAI and muscular strength ($r = -0.316$, $p = 0.001$).

Conclusions:

The key finding of our study is that muscular strength is inversely associated with body adiposity index. Among youth, low muscular fitness levels should be avoided for primary cardiovascular disease prevention.

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